

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Vapart's Disintegrator.

About twelve years ago an invention made by Carr applied a new principle in reducing materials of various degrees of hardness to fine powder. Until then the percussive action of heavy stamps or the grinding action of millstones were considered the only means available, and as a general rule hard material was thought to come more particularly within the scope of the former, while soft bodies were considered susceptible of most successful treatment in the latter. Carr's principle was that of disintegrating by the impact of a body hurled by centrifugal force. Elaborate experiments made at the Anzin mines in France proved, however, that Carr's apparatus, though applicable to harder materials, was not economically as valuable for such material as other machines, but compared very favorably with grinding machines and possessed a larger range of usefulness. Vapart's Disintegrator, of which we give an illustration taken from the *Praktische Maschinenconstrueteur*, is based upon the same fundamental principle of the utilization of power through the agency of centrifugal force. It consists of a closed vertical cylindrical casing, the inner surface of which is lined with three ribbed rings, each composed of several parts. Attached to it are two funnels, made of several sections. A vertical shaft passes through the center of the cylinder. As the illustration shows, it is provided with three horizontal disks, to which a number of angles are screwed. A scraper is fastened to the lowest disk for carrying the fine stuff to the discharge opening. Two hinged doors permit an easy access to the interior of the machine. The upper part of the vertical shaft is provided with a pulley, by means of which it is rotated. The number of revolutions of the shaft vary from 500 to 1000 per minute, according to the nature of the material to be ground and the fineness to which it is to be reduced. The stuff is charged through a funnel attached to the cover of the cylinder, and first falls upon the uppermost disk, upon which it is distributed by the angles. By centrifugal force it is hurled against the ribbed chilled cast-iron rings, and dropping down it slides along the funnel until it reaches the central portions of the second disk, from which it is again thrown against the second ribbed ring, and so on until it is discharged by the scraper already mentioned.

Extensive experiments have proved the machine to work well with very hard material, such as quartz, pyrites, blende and emory, and with softer substances like gypsum, salt, bones, dyewood, clay or coal. It is a great advantage of Vapart's Disintegrator that by a proper regulation of the velocity the degree of fineness of the product may be accurately regulated. The space it occupies is small and its parts are readily accessible. All portions which are exposed to the direct percussion of the stuff to be ground are immovable, a circumstance which tells very favorably on the durability of the machine. Very often it is desirable to mix various substances together intimately while they are being ground; this, it will be seen, is thoroughly accomplished. A machine with a cylinder 6 feet in diameter calls for from 15 to 18 horse-power. The disintegrator does not, of course, grind the whole bulk of the material uniformly fine. If, therefore, a given size of grain is required, the stuff coming from the discharge opening is passed through a screen of the proper size and all coarser portions are returned to the machine. The contrivances for this purpose do not in any way differ from those usually employed.

American Cars for Foreign Cities.

"Of all the industries developed by civilization," remarked John Stephenson to a representative of *The Iron Age*, "tramways are now in the ascendant." This interest, he affirms, has suffered less than any other, either in the United States or Europe, from the existing crisis. English capitalists were at first very reluctant to adopt American ideas in the construction of tramways, but in all roads of this character built since 1870 the stock has appreciated 50 per cent. All monetary papers in England refer to them as the most desirable class of investments. One result is that cars for English tramways in the principal cities of Great Britain or for the British colonies are being shipped from New York almost every day; those for London and Liverpool going by steamer, others mostly by sailing vessels. The veteran builder of cars and omnibuses is now in his 70th year, but apparently in the full vigor of active life. When the writer entered his office he was answering a letter just received from the Cape of Good Hope, making inquiries concerning the construction of tramways and methods of building cars, while the floors of the shop were filled with cars nearly ready for shipment to the North Metropolitan Tramway Company of London. The order was for 24 cars, secured in competition with the best "wagon builders," as they call themselves, of England and the Continent. Altogether there were 19 builders. This result is more significant if the fact is borne in mind that American cars are now running on two of the three great tramways of the British capital. The fact is also mentioned that the American cars are to displace ponderous vehicles built in Hamburg, and that two horses will be able to carry more passengers and with greater ease than was possible with three horses before. American cars were first intro-

duced into England at the opening of the road in Birkenhead, built by George Francis Train in 1860. We again furnished cars for the London and Liverpool road when opened in 1870. At the present time cars built in this city are running in Hull, Swansea, Wolverhampton, Leeds, Glasgow, Edinburgh, Aberdeen; and on the Continent in Lisbon, Brussels, Berlin, Hamburg, Amsterdam, Stockholm, Christiania, St. Petersburg and Vienna. In South America these cars are found in every city of any magnitude. Cars are now on the shop floors destined for Chorillo, a watering place on the coast of Peru, where they are run on an inclined plane, with an endless cable, and only a few days ago there were awaiting shipment cars for almost all quarters of the globe, including London, Kingston in Jamaica, Laguayra in Venezuela, Lima in Peru, Rio in Brazil, Adelaide and Wellington in Australia. A num-

ber of shipments have been made within a few months to Lima, where the late Mr. Meigs had obtained a concession for a tramway, torn down a part of the walls of the city in preparing a route and laid out a boulevard, but had not accomplished his purpose at the time of his death. In a word, cars built in New York City have been sent to all quarters of the globe except Africa, where no tramway has yet been built outside of Alexandria in Egypt; but, as before intimated, negotiations are in progress with reference to a proposed tramway at the Cape of Good Hope. Arrangements for building cars to run between Moscow and Odessa were broken up by the Russo-Turkish war.

A matter just now exciting remark is the rapid building of tramways in the British colonies and the demand for American rolling stock and materials. Cars are being shipped from New York at this moment to Adelaide and Gawlerstown in Australia. There have been shipments already to Wellington, New Zealand, where they are just opening a tramway, and a like improvement is about to be commenced at Christ Church. They are also about constructing a tramway at Hobartstown, Van Dieman's Land, now called Tasmania, where the American plan has been adopted, using to a great extent American material. At Sidney, Australia, some New York men for whom Stephenson built omnibuses in former years have merged their interest into a tramway,

proposing to introduce American cars. For some time past these parties have been receiving information and materials preparatory to this enterprise. Several of their omnibuses have already been transferred from Sidney to Yokohama to make a line to Yedo. Proposals have been received in New York for six miles of tramway materials and rolling stock.

The weight of American cars is less than half the weight of cars made in Germany, as shown by the annual report of the Berlin Tramway Company. This fact is also noticed in Glasgow, where cars of American build are worked with one-third less horse-power than their own cars. As to strength, the president of the North Metropolitan Tramway Company of London stated at the last meeting of stockholders that English cars had a life service of 4½ years; American cars, 30 years. Mr. Stephenson thinks

these new works is three miles from the heart of the city, making a new town to be called Argo. A railway, with both the wide and narrow gauge, connects the works with all the railroads running into Denver, thus affording facilities for the transmission of ore from all of the running sections. This Boston and Colorado Company has become rich by its smelting business at Black Hawk, and has also been a vast benefit to the mining interests of Colorado, no other undertaking of the kind having been equally successful. The new works will cover five acres of ground, combining twelve calcining and ten smelting furnaces, 5 blocks, containing 30 tenement houses, 6 tenements each, and a large boarding house, &c. One important feature in these works is the preparation for using lower grade ores. At Black Hawk the lowest grade

reach 400,000,000 bushels. Harvest is over in the Southern winter wheat districts, and the wheat is reported to be excellent in quality and the yield large. It will be impossible to give figures for some time to come, as statistics of this kind are always difficult to obtain.—*American Miller*.

Francq's Tramway Locomotive.

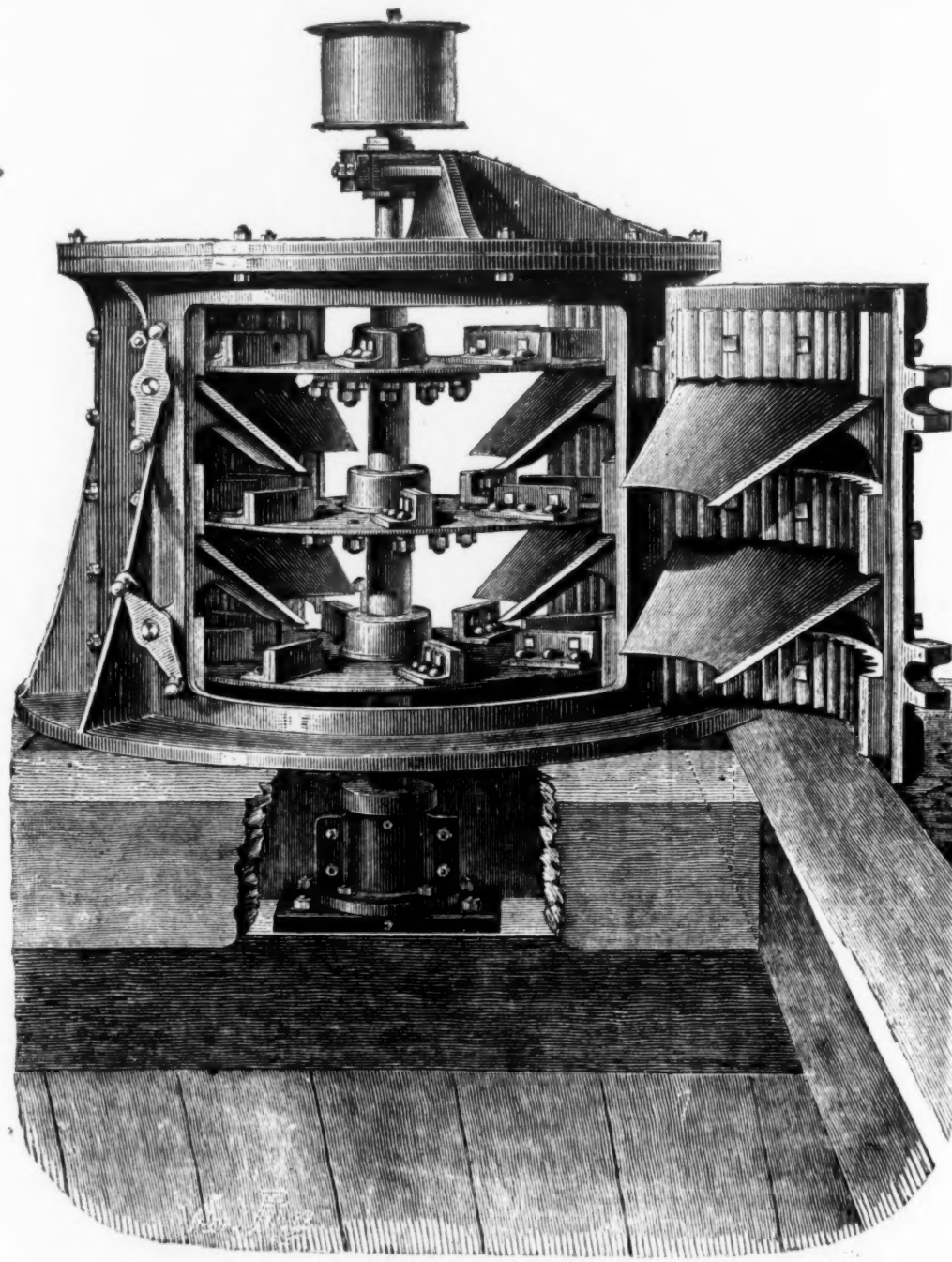
M. Leon Francq has introduced into France his system of tramways with fireless locomotives. The locomotive consists essentially of a cylinder, in which the steam is stored at the starting point, the initial pressure being 15 atmospheres. The cylinder is so well protected by non-conducting substances that when left at rest at an outside temperature of 32° it loses only one atmosphere in four hours, and after 24 hours there is still pressure enough to allow the machine to run. The high pressure of 15 atmospheres must, however, be reduced to 3 or 5 atmospheres before the steam enters the working cylinder for running the machinery, which is the same as in any ordinary locomotive. The diminution of pressure is effected by a throttling apparatus which cuts off the steam more or less, and which may be regulated by means of a lever within reach of the engineer. Another lever serves to vary the expansion of the steam in the cylinder. The exhaust steam is condensed in a special apparatus, consisting of a closed cylinder through which 600 open tubes pass. The air circulates in these freely, and as the cooling surface is enormously great the condensation is effected very rapidly, so that but little steam escapes, the inconvenience of which cannot be compared to the black smoke and glowing cinders coming from ordinary locomotives. The time required for filling a reservoir holding from 50 to 60 cubic feet is 15 minutes with a single boiler. It is filled with steam, but in reality a large quantity also of hot water under pressure is obtained, which during the running furnishes additional steam. As soon as the reservoir is filled the locomotive is ready to run. It can make 7 miles an hour on a level road with one or two cars weighing 8 to 10 tons. The pistons are 9 inches in diameter and make a 10-inch stroke, which with the pressure of 5 atmospheres corresponds to 16 horse-power. The weight of the loaded locomotive is 8 tons. The locomotive has been working for months on a 9-mile road from Marly-le-Roi to Reuil. A comparison of cost with small ordinary locomotives on the same road has shown the expenditure for the Francq system to be about one-half less.

Utilization of Poor Copper Ores.

Dr. Adolf Gurit, a well-known German metallurgist, has communicated to the *London Mining Journal* a letter on the utilization of poor copper ores (1½ per cent.), from which we take the following:

When approaching the problem the author saw as the principal points before him that the sulphide of copper is to be converted into a soluble combination by the cold way, and that the substances required for it must lie within easy compass of the mines. This consideration led to the conviction that either sulphate or chloride of copper must be obtained without heating or calcining, and within a time not greater than is required by the calcining process—six to eight months. The experiments have proved that the operation goes best by forming chloride of copper by the action of ordinary or sea salt, and a little sulphuric acid upon the raw ore of the size of gravel, when it is kept moist, and the access of atmospheric air freely permitted. The principal part in this process is played by the oxy-chloride of copper, which is easily formed from the chloride by the absorption of oxygen. This oxy-chloride, in contact with sulphide of copper, becomes a powerful oxidiser of the latter, which is converted first into sulphate, and by the presence of salt immediately afterward into chloride of copper. So the chloride of copper becomes the means of rapid oxidation by absorbing oxygen from the air and by giving it up to the sulphide of copper, as long as the latter and chloride of sodium or salt are present. The trials, at first made on a small scale, have been going on since the end of March on a large scale at the Duisburg Copper Works, under the superintendence of Dr. C. Fabian, the director of the works, with raw Rio Tinto ore. They have proved that with proper arrangements already (after 10 to 14 days) more than one-half of all the copper has become soluble, which result is only obtained after six to eight months in the old way at the mines.

The amenities of journalism in the West are illustrated in the following bit of pleasant newspaper gossip: A daily newspaper in Chicago announced that it had sent out a scientific expedition to observe the eclipse, and a contemporary remarked in reply that "the unwashed blackguards of the meretricious *Daily Shout* are at it again;" that the "expedition consists exclusively of one man who occupies a seat in the car, or adjoining one, in which are the two scientists," and added, as to the expedition's abilities: "As well might the navy who digs the sand which enters into the composition of the glass of which the lenses are made attempt to illustrate the laws governing the refraction of light."



VAPART'S DISINTEGRATOR.

there is something in American wood and American iron, but there is more in the manner of construction.

America excels in fine woods. In building a car the whole substructure, the parts most liable to decay, are of white oak; the frame is of white ash, and white pine, hickory, elm, cherry, &c., are variously introduced. The British use teak from India, a wood that is heavy and unsuitable, while their panels are usually of mahogany, which is heavy and expensive, and, moreover, must be used in sections, whereas our whitewood is of any length desired. We use for flooring white pine, while the English use heavy Norway deal. The total weight of an American car varies from 5000 to 5500 pounds, the deck seats of those used in London making a difference of at least 300 pounds. American builders are now running into what may be called the refinements of car construction, having especial reference to the pleasure and comfort of passengers. Great progress has been made since the first tramway car was built by John Stephenson in 1831, to run on Fourth avenue, N. Y., when John Mason was president of the road. The vehicle resembled an English stage coach and was hung on leather thoroughbraces.

The Boston and Colorado Company are going to remove their extensive smelting establishment from Black Hawk to a point near Denver, and are now building exten-

treated is 45 per cent. of metal, whereas the new works will treat 25 per cent. ores. This will be of infinite advantage to the mining interests, as large quantities of the lower grades of ores have remained unutilized, large amounts now lying in "dump."

The glowing prophecies that have been made on all sides as to this year's wheat crop bid fair to be fulfilled. It is almost impossible to obtain accurate data respecting the crops, both from the nature of the subject, the wide extent of territory which a review must take in and the reports of interested parties. The best informed authorities estimated last year's wheat crop at 330,000,000 bushels, whereas in reality it reached 350,000,000 bushels. There seems no disposition this year to be modest in making estimates. Few place this year's crop below 400,000,000 bushels, and those of a sanguine disposition increase these figures by 25,000,000 or 50,000,000 bushels. Many predict confidently that Minnesota's crop will reach 60,000,000 bushels, and that Iowa and Kansas will follow with 45,000,000 and 30,000,000 respectively. Even Dakota, it is said, will produce 15,000,000 bushels, and Nebraska 25,000,000. Of course some allowance must be made for these figures, but the indications are now that the present crop of wheat will be by far the largest ever produced in this country, and will probably

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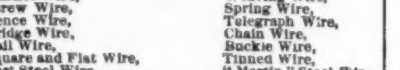
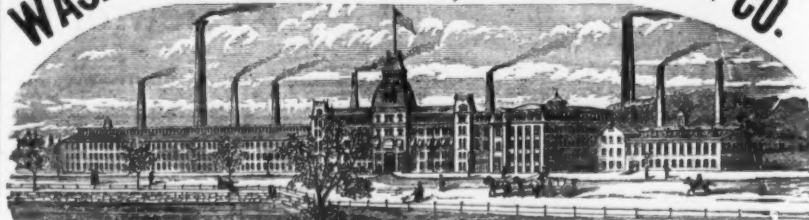
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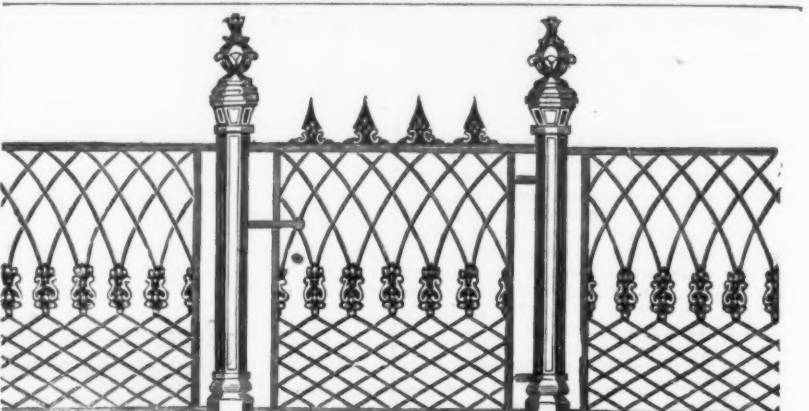
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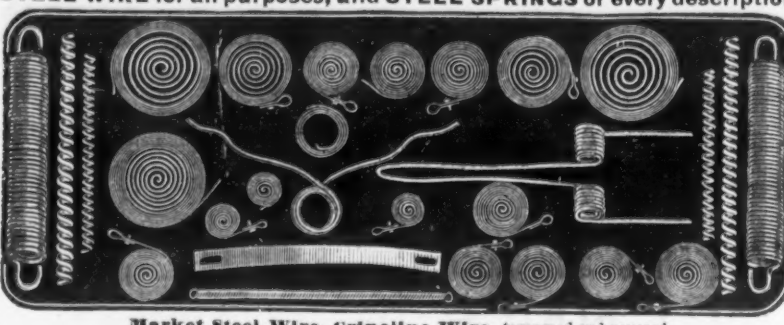


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The most that can be said of any other Kerosene Stove is that it may not explode. The least that can be said of the Windsor Stove is that it cannot explode.
It affords a good margin to the dealer, and its merits make it the easiest stove to sell and the most satisfactory to the buyer.
W. A. HULL & BRO.,
35 Park Place, New York.



The Practical Aspects of Coal Washing.

To the Editor of The Iron Age: Frequent mention has been made in your columns of some of the points involved in the coal-washing question, but there are still some things of the same general sort which are rarely or never said, but which bear seriously on the real economy, or, what is the same thing, upon the profit of scores of our manufacturing establishments.

It is reasonable that confidence and pride should be felt and expressed in the great stock of good coal at the command of manufacturers in this part of the world, and in the future we shall doubtless draw far more heavily than now upon our infinite stock of inferior and poor coal. At the same time, however, it is but reasonable to lay more stress upon the profound indifference of many manufacturers, even in a prostrate market, to the question of what their coal or other fuel, whether good or bad, really costs them when its actual quality is considered, provided only they can get it cheap, that is, at 2 or 3 per cent. greater discount from quoted rates than that at which some one else gets it, or with the largest drawback allowed in the whole district upon freight rates.

Some of our friends of this type would be surprised to be informed, and they may very easily inform themselves, that most of these minute differences of prices and of rates, over which some hard-fought battles are waged, are but the small dust of the balance as compared with the technical questions involved in the character or quality of the coal itself, and in the methods of its use. How many manufacturers are there, for instance, who know to-day how much ash their coal is really carrying, and how far it exceeds a standard or limit that may justly be set, and to which coal agents may be required to conform in the quality of the supply furnished. Right here one is liable to be met, and generally is in such queries, with the suggestion that manufacturers are apt to be practical men; that they can tell by looking at the coal or at the ash itself how much there is of it; that they never need to have anyone theorize over their coal, or the way they burn it; that they can tell a good fireman by the way he shovels coal, &c. As one possible evidence of the practicalness or otherwise in this respect of some of our friends, let them set one of their clerks to figure out the answers to the following questions among others that will suggest themselves, and thus to see whether the results reached in their own figuring will involve or present anything new or useful to them; or, if not absolutely new, whether they can afford to refuse following the lead of the simple calculation, even though somewhat similar means may have been used before to indicate to them the true economical path.

These are some of the questions:
1. How much ash does our coal, as now supplied to us, really contain?
2. Is this more or less than we have been troubled with before?
3. Is this more or less than we might find in some other kind of coal at the same price we now pay?
4. What would be the explanation offered us if it were known that in one lot of coal we had found 6 per cent. of ash, and in another lot at the same price we had found 13 per cent.?
5. What is the total amount of freight money that we pay monthly on the excess of ash in our coal above a limit that we might establish without injustice to anyone?
6. How much freight money could we save, other things being equal, if there were no ash at all in the coal?
7. How much more could we afford to pay in price and for freight for a coal that would meet a close standard limit than we now pay for what is sent us?
8. Do we lose anything—and if so, how much—in the useful work done by our coal, as we burn it, by being compelled to heat up in the furnace this extra 5 or 8 per cent. of ash.

9. How does the effect produced by this extra 8 per cent. of ash differ from that which would be produced by the throwing on to each car of coal, before it is weighed to us at the mines, of say half a ton of earth or sand? and what would be thought of a man who knowingly had bought such cars of coal?
10. What would it cost to weigh all the ashes from our works as they are hauling away to the dump?
11. What is the proportion of unconsumed coal that goes to waste in the ash heap? and does this proportion increase with the amount of ash in the coal?
12. How does this proportion of unconsumed coal compare with the amount of combustible matter found in some of the lean French or German coals, which it is found quite practicable to render fit for use?
13. What would the saving amount to per year if this unconsumed coal thus remaining in the ashes could be burned up 15 or 20 per cent. more closely than it really is? and what would the saving amount to if it could be entirely burned up?
14. Could we help ourselves in this respect by employing firemen of a higher order of intelligence or at a higher rate of pay? and how great would the saving, if any, thus effected have to be to offset any assumed advance in wages?

What is there unpractical or in any respect unnecessary in such questions? Not one involves any handling of apparatus but an ordinary scale and a shovel and cart, and certainly nothing but the four simple rules of arithmetic. No complex accounts need be kept, though a clearer appreciation of the facts involved would be had by putting them into the common graphic form of lines drawn upon a simple ruled chart. This method, by the way, can be very easily learned by a good office clerk from any sensible draughtsman if he cannot contrive it for himself. Indeed, all our managers and manufacturers ought to familiarize themselves with the use of this method of noting and reading the numerical statements of their business, for in it they are certain to find a surprising help in comparing the results or prices involved in their work one week or month with another.
If this line of inquiry, then, be legitimate, and every man can convince himself, the utility and vital importance of the coal-

washing question may be found, in some districts, to compel attention in a surprising way as soon as the inquiry is carefully made.
PLAINFIELD, N. J. P. BARNES.

The Holly System of Heating Proposed for New York.

Recently a party of gentlemen from this city, including some capitalists, one or two engineers and a few scientists, visited the city of Lockport, N. Y., to observe the workings of the Holly Steam Company's system of heating buildings by means of steam and hot water. The object of the visit was to determine the practicability of introducing the system into New York. The result of the investigation proved entirely satisfactory, and a purchase of the right of this city was made. A company is now being formed here by several prominent gentlemen, and \$1,000,000 has been pledged thus far to begin the application of the system. It is intended ultimately to district the city into five divisions, so as to supply the steam and hot water from one end to the other and on both sides. This is to be done by the construction of five "plants" or batteries, each battery containing fifty boilers. Two of these "plants" will be below Central Park, at some point on the East and North rivers; one on each side of the park, and one above the park, for Harlem and Washington Heights. From the "plants" large pipes, or mains, will be laid through the main streets, with connecting pipes for the cross streets, just as the Croton water-pipes are laid. Each building using the steam will be furnished with a meter, as by gas companies, and charged according to the amount used.

From experiments made it was found that steam can be forced a distance of two miles in any direction from a "plant" without any difficulty, and it is claimed by Mr. Holly that it can be forced even five miles if necessary. By this means local boilers, engineers and firemen, &c., can be dispensed with. The condensed water is received in a trap or reservoir in the basement of each building, where it is reheated by the application of live steam and sent again by a proper system of pipes through the building, thus keeping a perfect circulation of both steam and hot water, the steam being used for ordinary purposes.

One of the combinations of the patent which will be furnished is for the purpose of removing snow and ice from the streets and sidewalks. A receptacle, 1 foot by 6, near the curbstone, with a coil at the bottom, will melt the snow as fast as it falls, and the water therefrom will be conveyed to the adjacent sewer. Experiments last winter have shown that the cost of melting a ton of snow in this manner will not exceed five cents.

Experiments have also proved that hydrants placed alongside those now used will furnish hot water and steam for the Fire Department, thus doing away with the heavy boilers now in use. Each consumer in dwelling houses will be furnished with a stove which connects with the pipe, and cooking can be conducted as at present, with the exception of frying and broiling. Each "plant" will require a building covering 200 square feet of ground, built of brick and four stories high. The first floor will be used for the boilers, and the others for ordinary mechanical purposes. It will require 2500 tons of coal a day to keep the five "plants" running.

From 50 to 60 lbs. of steam have been estimated to be sufficient for ordinary house pipes, and the water can be carried by an ingenious and simple contrivance to any part of a dwelling, either by atmospheric pressure or by the application of the direct force of steam for that purpose without the aid of pump or engine.

Cost of Pumping Water in Cincinnati.

Below we give some interesting figures in regard to the cost of pumping water at various stations of the Cincinnati (Ohio) Water Works. In 1877 it cost \$58 per million gallons to elevate water from the Hunt street pumping works to the Mt. Auburn reservoir; in 1877 it cost \$26 per million gallons; this year it is costing \$22, and next year it may—we can't be sure it will—cost less. The high service requires about 658,000 gallons a year. The present annual saving there alone is the little sum of \$23,400. The cost in 1877 per 1000 gallons for this high service was nearly six cents; in 1878 to the present it is a little above two and one-fourth cents. In the low pressure service the pumping cost per million gallons in 1873 \$21.07, or about 2 cents per 1000 gallons; in 1877 it cost \$11.34, or a little above 11-10 cents per 1000 gallons, and at present it is costing less, and next year it might and should—but it is not certain it will—cost still less. This low pressure—Eden reservoir—service is required to furnish the city daily the year round an average of 17,000,000 gallons of water, or the enormous quantity of 6,205,000,000 gallons. The saving of cost in pumping on each million gallons in 1877 over that of 1873 is the difference between \$21.07, the cost in 1873, and \$11.34, the cost in 1877, which is \$9.63. This sum during the present hot month is saved 21 times a day, or nearly once every hour, for the city is now using 21,000,000 gallons of water a day. In a year it is saved 6205 times, or was last year, and that sum in dollars and cents foots up \$59,754.15. Add to this the \$23,400 for the Mt. Auburn high service and \$85,154.15 is the annual saving. The minimum has not yet been reached, but the approach to it seems to be constant and persistent, as the following figures for the first six months of the present year show. Tons of coal consumed for each 1,000,000 gallons of water pumped: In 1877, 2,511-100 tons the first six months; in 1878, 2,281-100 tons for the first six months. Coal used first six months of 1877 to pump 3,021,580,000 was 7595.09 tons. Coal used first six months of 1878 to pump the same amount of water was 6889.20 tons, a saving of 705.89 tons of coal in six months of 1878 as compared with 1877, or about \$3000 saving per year over 1877. There is, however, room to continue the improvement a long time before an altogether satisfactory figure for the cost of pumping is obtained.

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stance of a number of practical Iron Masters, ex-
pressly to afford prompt and reliable information
upon the chemical composition of the substances
above mentioned, for smelting and refining pur-
poses. The object being to make it at once a con-
venient, practically useful, and comparatively in-
expensive adjunct to the Furnace, Forge and Rolling
Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of Pure Iron in
an ordinary Ore..... \$4.00
For the per cent. of Pure Iron, Sulphur and
Phosphorus in do..... 12.50
For each additional constituent of usual oc-
currence..... 1.50
For those of unusual occurrence or difficult
to determine, the charge must necessarily
depend upon circumstances.
For determining the per cent. of Sulphur or
Phosphorus in Iron or Steel..... 7.00
For each additional constituent of usual oc-
currence..... 5.00
For the per cent. of Carbonate of Lime, and
Insoluble Silicious Matter in a Limestone..... 10.00
or each additional constituent..... 2.00
For the per cent. of Water, Volatile Combust-
ible Matter, fixed Carbon, and Ash in Coal..... 12.50
For determining the constituents of a Clay, Slag,
Coke, or of an Ash in Coal the charges will cor-
respond with those for the constituents of an ore.
For a written opinion or letter of instruction the
charge must necessarily depend upon circum-
stances.
Printed instructions for obtaining proper average
samples for analysis furnished upon application.

BOSTON ROLLING MILLS

Manufacture

Extra quality small Rods, from best selected Scrap Iron.

SWEDISH AND NORWAY SHAPES,

Nail and Wire Rods. Also,

Horse Shoe Iron, Hand Made

Horse Shoes & the Boston

Horse Shoe.

BOSTON ROLLING MILLS, W. R. ELLIS, Treas.

Office, 17 Battery March St., Boston.

BRADLEY, REIS & CO.

NEW CASTLE, PA.,

Manufacturers of every description of

PLATE & SHEET IRON

OFFICE, at Works.

Bonnell, Botsford & Co.,

Iron, Nails & Spikes.

YOUNGSTOWN, OHIO.

Spooner & Collins,

COMMISSION AGENTS,

PIG IRON

Blooms, Bar, Sheet & Hoop Iron.

217 N. Third St., St. Louis.

ANVIL NAIL CO.

We desire to call the attention of the trade to

our new manufacture of

Steel Horse Shoe Nails,

Made from metal prepared in the Martin-Siemens

Furnace by our PATENT process, which produces a

nail having all the requisites for a

PERFECT HORSE SHOE NAIL.

The well-known desirable properties of a perfect

nail are, that the POINT should be sharp, the SHANK

stiff, to drive without crippling under the hammer,

soft enough to clinch readily, while sufficiently

tough to avoid all danger from the "drawing the

clinch" or breaking the neck under the head.

These properties we claim for the

"ANVIL HORSE NAILS."

In the process of manufacture the metal is com-

pressed under the head, which gives the nail great

strength where it is required (between the shoe

and hoof), and the cold rolling gives it a stiffness

attained in no other way, while the quality of

the metal used insures a clinch and point un-

surpassed by any nail ever offered in the market.

Samples and prices sent on application.

ANVIL NAIL CO.,

65, 67 and 69 Washington St., New York.

BORAX.

Concentrated Borax in sacks.

Selected concentrated Borax in barrels.

Refined Borax in cases.

Pulverized Borax in barrels.

Pulverized Borax in pound and half pound packages.

Being Sole Agents for Messrs. Smith Bros., OWNERS OF

THE MINES, we are enabled to sell at the lowest prices.

W. H. T. COLEMAN & CO.,

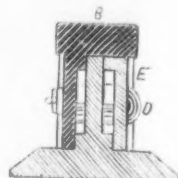
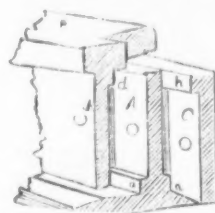
NEW YORK, 100 Pearl Street.

SAN FRANCISCO, CAL., Cor California and Front Sts.

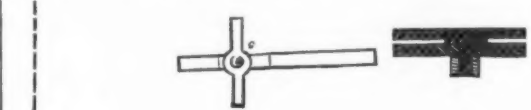
New Patents.

We take the following abstract of new
patents, recently issued, from the official
record:

COMPOUND RAILS.

To Charles Conrad, Genoa, Mich.—April
23.—A compound rail consisting of a broad
base having a central vertical web, a tread
portion having a downwardly projecting
flange, and a side plate which supports one
edge of the tread, the said plate and the
flange of tread resting upon the base and
being spaced from the vertical flange thereofby shoulders upon the several parts. At the
rail ends the several parts project one be-
yond the other, the tread being provided
with a lap or shouldered portion, whereby,
when the sections are abutted together, and
the rails are united by bolts passing through
the several parts and through washers lo-
cated in the spaces between the vertical por-
tions of the rail, a continuous rail is formed.1. In a compound rail, the foot A, having a
center web, in combination with the head
B, provided with the downwardly-projecting
flange b, the plate C, and the offsets a d h
on the several parts.2. A compound rail consisting of parts A
B C, extended different distances from the
body of the rail, the head of the rail being
provided with projection m.3. A compound railway-rail wherein the
parts A B C are combined and secured to-
gether by the bolts D and intermediate
washers.

BENCH-PLANE.

To Charlotte Smith, Chelsea, Mass.—April
23.—1. The double curved plane-iron top
shown, in combination with the plane-iron,
the shoulder, the screw D, and a nut.2. The combination of the thumb-screw
with its arms, the screw D, the shoulder
seen, a plane-iron, and a plane-iron top.

MICROMETER-GAGES.

To George M. Pratt, Middletown, Conn.—
April 23.—1. A gage-screw for measuring

instruments, having its end formed by a

separate tip of tempered steel.

2. A micrometer gage-screw having a
socket formed in its end, and provided with
a separate tip of tempered steel or similar
hard material.

SPEAKING-TELEPHONE TRANSMITTER.

To George B. Richmond, Lansing, Mich.—
April 23.—1. In a hydro-electric telephone,

the combination, with the vertical dia-

phragm, of the horizontal platinum points

and the water tube.

2. In a hydro-electric telephone, the flex-

ible water tube.

3. In a hydro-electric telephone, the com-

bination, with the flexible water tube E, of

the rigid tube E', upon which the flexible

tube is mounted.

4. The combination, with the diaphragm,

of the flexible water tube and the platinum

points passed through the walls of the flex-

ible tube on opposite sides thereof, and in

line with the center of the diaphragm.

5. The frame for a telephone, consisting

of the base A, standard A', and cap C.

DOOR CHAIN.

To Thos. F. Stevenson, Brooklyn, N. Y.—
April 23.—A door check or fastening chain

provided with a weight at one end, in com-

bination with the mouth or stop piece

through which the chain passes, the vertical

case containing the weight, and provided

with lugs for securing said case in position.

Neutralization of Fatty Acids in Steam

Engine Condensers.—The fatty substances

with which cylinders and slide valves are

lubricated are decomposed by steam and

furnish fatty acids and glycerine. These

products are carried into the condensers,

from which they are taken into the boilers.

The acids rapidly attack the iron and form

large quantities of black, dense deposits,

mixtures of varying amounts of iron soap

and soap of oxide of iron. These deposits

adhere to metallic surfaces firmly, and the

sheet iron which they cover, being prevented

from contact of water, are dangerously sub-

ject to burning. It is, therefore, important

for the preservation and safety of steam

boilers not to allow any fatty acids to get

into them, or at least to make them enter

into a harmless compound which is not de-

composed by the action of metals in con-

tact. This means would, of course, be re-

quired to be cheap and simple. This Mr.

Helet has succeeded in doing with the aid of

an aqueous solution of lime, by which the

water entering the boiler is made neutral, or

even slightly alkaline, carrying with it only

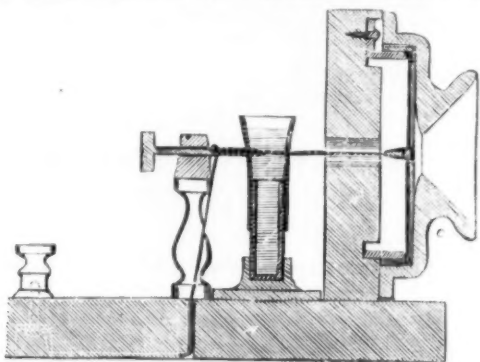
an insoluble lime soap and free glycerine.

Both of which neither act upon the iron nor

adhere to it. The neutralization of the

water is fully completed before it can enter

the boiler.

Rapid Construction of a Large Stamp
Mill.Some two months ago Messrs. Rankin,
Brayton & Co., of the Pacific Iron Works,
entered into a contract with Mr. W. H.
Cilley, manager of the Cerro de Pasco Min-
ing Company, of Peru, for the construction
of an eighty-stamp silver mill for that Com-
pany. This great work has just been com-
pleted, and the machinery, weighing 600
tons, has been put aboard the bark Rutland-
shire, chartered for the purpose, and will
be immediately dispatched for Callao, the
port of destination. This immense mill is to
be erected at the celebrated Cerro de Pasco
mines, which are situated in the heart of
the Andes, at an elevation of some 14,000
feet, and about 150 miles east of the city
of Lima. They were discovered, accordingto the records of the Jesuit Missionaries, in
the year 1630, and though worked by the
slow and crude arastra process, and to
the depth of only about 300 feet, have pro-
duced, according to the Government records,
the enormous sum of \$500,000,000. The late
Harry Meiggs entered into a contract with
the Peruvian Government for the construc-
tion of what is called the Aroya Railroad,
running from the city of Lima to the Andes,
connecting with the above-named mines and
the fertile valleys of the eastern slope. This
road crosses the mountains at an elevation
of 15,000 feet—more than twice that of the
Central Pacific at its highest point—and
has perhaps more heavy tunnelling and
difficult engineering than any other road
in the world. This contract was entered
into principally for the development of the
mines referred to, and involved an expendi-
ture of some \$25,000,000.Mr. Cilley, who was the associate of the
late Harry Meiggs, and the other executors
of his will have assumed all his contracts,
and are pushing vigorously both the min-
ing and the railroad enterprises. The mill,
designed and constructed by Rankin, Bray-
ton & Co., has all the improvements known
in this class of work. The machinery is
of unusual weight and strength, and in de-
sign and workmanship probably excels any-
thing heretofore constructed in this way.
In order to admit of mule transportationover the incomplete portion of the road—
some 70 miles—all the machinery has
had to be made in sections, so that no piece
should exceed 300 pounds in weight. This
required great ingenuity of design, as well
as accuracy of workmanship. Some idea
of the magnitude of this work may be in-
ferred from the fact that the mill, as thus
constructed, contained more than 17,000
pieces. This work has been completed by
the Pacific Iron Works and is put on board the
vessel in 50 days from the signing of the
contract.

Proposals for furnishing cast-iron water

pipe for the city of Chicago were opened at
the office of the Department of Public
Works recently. The following establish-
ments were represented: Dennis Long &
Co., Louisville, Ky.; H. R. Smith & Co.,
Columbus, Ohio; Shickle, Harrison & Co.,
St. Louis, Mo.; Cincinnati & Newport Iron
& Pipe Co., Newport, Ky.; Jas. Marshall &
Co., Pittsburgh, Pa.; William Smith, Pitts-
burgh, Pa.; Drullard & Hayes, Buffalo, N.
Y.; and R. D. Wood & Co., Philadelphia,
Pa. The contract was awarded to Dennis
Long & Co., of Louisville, Ky., they being
the lowest bidders.

CHESTER IRON COMPANY,

MINERS AND SHIPPERS OF

Magnetic Iron Ore.

The "BLUE" (Red Short) and "RED" (Neutral) Bessemer Ores, from Hackle-
barney and Chester, New Jersey.

Price "Blue" Ore hand-broken and selected for July is \$2.50 cash, f. o. b. Hacklebarney Mines.

J. WESLEY PULLMAN, Treas., 407 Walnut St., Philadelphia.

The Cambria Iron and Steel Works,

Having enjoyed for over TWENTY YEARS the reputation of producing the best quality of

RAILS,

have now an annual capacity of

100,000 Tons of Iron and Steel Rails, Splice Bars, &c.

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CAMBRIA IRON COMPANY,

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Or at the Works, JOHNSTOWN, PA.

Or J. S. KENNEDY & CO., New York Selling Agency, 41 Cedar St., N. Y.

THE PHOENIX IRON CO.,

410 Walnut Street, PHILADELPHIA.

Manufacturers of

CURVED, STRAIGHT AND HIPPED

Wrought Iron Roof Trusses, Beams, Girders & Joists,

and all kinds of Iron Framing used in the construction of Iron Roof Buildings.

DECK BEAMS, CHANNEL, ANGLE AND T BARS

curved to template, largely used in the construction of Iron Vessels.

PATENT WROUGHT IRON COLUMNS, WELDLESS EYE BARS,

For Top and Bottom Chords of Bridges.

Railroad Iron, Street Rails, Rail Joints and Wrought Iron Chairs.

REFINED BAR, SHAFTEING, and every variety of SHAPE IRON made to Order.

Plans and Specifications furnished. Address,

SAMUEL J. REEVES, President.

The Standard Steel Works.

LOCOMOTIVE AND CAR WHEEL TIRES,

Manufactured from the celebrated OTIS STEEL.

BRAND

STANDARD.

Quality and efficiency fully guaranteed. Prices as low as any of the same quality.

We manufacture

Heavy and Light Forgings, Driving and Car Axles, Crank Pins, Piston Rods, Etc.

Works at Lewistown, Pa.

Office, 220 S. 4th St., Philadelphia, Pa.

JAS. ROWLAND & CO.,
Kensington Iron, Steel & Nail Works,
920 North Delaware Ave., - - PHILADELPHIA,
Manufacturers of the
Anvil Brand Refined Merchant Bar Iron.
Also, the James Rowland & Co. Kensington Nails, cut from their
Refined Anvil stock. Also, Plow and Cultivator Steel, Rounds,
Squares, Flats, Bands and Hoop Iron.
Correspondence with Dealers solicited.

PENCOYD IRON WORKS.

A. & P. ROBERTS & CO.,

Manufacturers of

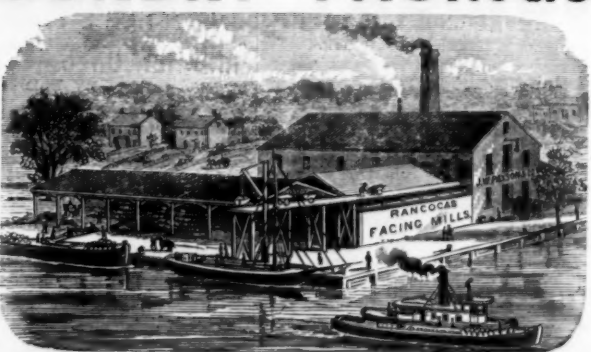
CAR AXLES.

BAR, ANGLE, TEE AND CHANNEL IRON.

Office, No. 265 S. Fourth St., Philadelphia. Agents for the sale of Glamorgan Pig Iron.



FOUNDRY FACINGS.

MANUFACTURERS' FOUNDRY
SUPPLIES.

MOULDING SAND

GERMAN LEAD, BITUMEN, SIEVES, MACHINERY SAND,
AMERICAN LEAD, ANTHRACITE, SHOVELS, BRASS
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PLUMBAGO, MINERAL, CRUCIBLES, STOVE PLATE

J. W. PAXSON & CO. } 514, 516 and 518 Beach St., Philadelphia, Pa.

OFFICE & STOREROOMS,

THE BEST KITCHEN AND TOILET WARE.

It is made of
Decarbonized Iron
and Covered with
a Perfect Enamel
of Unquestionable
Purity.



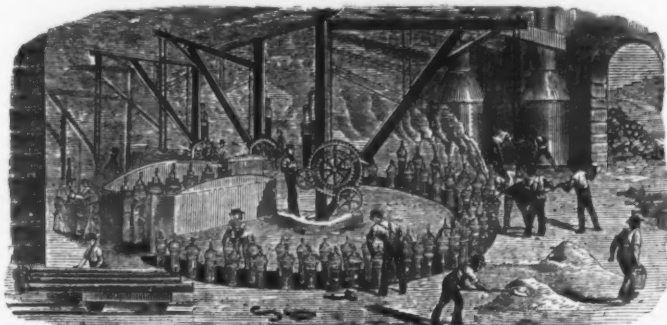
Its Merits have
been tested and are
vouched for by the
Foremost Chemists
and Experts in the
Land.

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PRICE LISTS, DISCOUNTS AND TESTIMONIALS FURNISHED THE TRADE.

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General Foundry Work.

CAST IRON PIPES

FOR WATER AND GAS.

Light Castings and Metal Patterns

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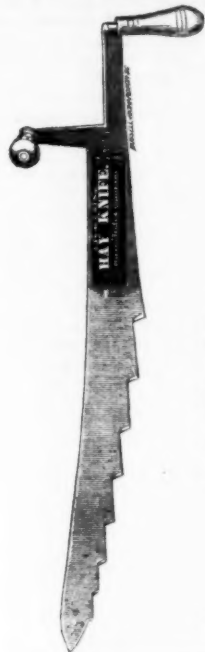
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Iron Founders,

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CORRESPONDENCE SOLICITED.

Will make estimates on completed work when desired.



LIGHTNING HAY KNIVES,

WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and seems destined to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each, of 50 lbs. weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

Hiram Holt & Co.,

East Wilton, Franklin Co., Maine.

For sale by the Hardware Trade generally.

SEMPLE & BIRGE MFG. CO., Agents at St. Louis.



PATENT Corrugated Bottom COAL HODS, ALSO, PATENT Oriental Funnel COAL HODS.

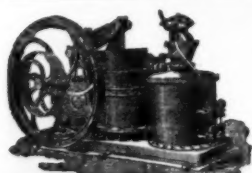
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F. HABERMAN,

No. 294 Pearl Street, - - NEW YORK.

ALSO, MANUFACTURER OF

TIN WARE.



BROWN'S CALORIC ENGINE.

Superior to any Hot Air Motor in Market.
Is the most perfect substitute for any other power. Its special merits are: Simple construction and durability. The consumption of fuel is about 2 1/2 pounds per horse-power and per working hour. Accidents of explosive nature are impossible. No water tax. No extra insurance. Replenishing the self-feeder does not cause any stoppage or slackening of the power. These machines can be seen in sizes of 3 1/2, 7 and 14 horse power, at the
BROWN CALORIC ENGINE CO., 57, 59 & 61 Lewis St., N. Y.
Larger sizes per contract. Apply for illustrated price list.

Aug. P. Brown's Safety Steam Engine Governor.
Apply for circular. 57, 59 and 61 Lewis St., New York.

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Southern States Coal, Iron & Land Co.

LIMITED,

ENGINEERS, IRON FOUNDERS & BOILER MAKERS,
Coal Miners and Fire Brick Manufacturers.

The Only Makers in the Southern States of

WASHED FOUNDRY COKE,

Free from Slate and Sulphur.

Machine-Made Brick, Limestone, Lumber and Shingles.
FARMS TO LET.

Apply to the HEAD OFFICE, South Pittsburg, Tennessee.

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DEALER IN

MINERAL LANDS,

Chattanooga, Tenn.

Offers for sale, at very low figures, some of the most valuable Charcoal and Coke Properties within the district. Full particulars furnished on application.

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MANUFACTURERS OF

BAR IRON, NAILS, RAILROAD SPIKES, FISH BARS AND BOLTS BRIDGE
AND CAR BOLTS, AND FORGINGS GENERALLY.

ROANE IRON COMPANY,

Manufacturers of and Dealers in

Pig and Railroad Iron.

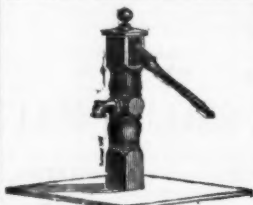
CHATTANOOGA, - - - - - TENN.

WASON CAR & FOUNDRY COMPANY,

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Manufacturers of

RAILWAY FREIGHT CARS, Car Wheels and Castings.



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Plain and Porcelain Lined Pumps.

Patent Improved Rubber Bucket Chain Pumps.

Pump Material in the rough or in the white. The very best quality of work at lowest prices.

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Proprietors of the Sewanee mines, capacity of 50,000 bushels of coal and coke per day. Several important institutions of learning, including the University of the South, also the celebrated Beersheba Springs, are located upon the line of this Railroad. Being also the proprietors of several extensive tracts of very fine lands, offer special inducements to colonies. Communications addressed to the General Manager will receive prompt attention.

T. J. BROWN,

Rockwood, Tenn.

Miner and Contractor of
Fossiliferous Ores.

A superior article delivered at low figures at any furnace within the district or at any point on the Ohio River. Refer to Roane Iron Co., Chattanooga Iron Co., or S. B. Lowe, Chattanooga.

S. Whinery, Civil Engineer,

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Late Division Engineer Cincinnati Southern Railway. Will prepare plans and superintend construction of Bridges, Buildings, Roads, Streets, Water Works, Sewers, Canals and other public works. Examinations, location and construction of railway lines a specialty. Surveys, examination and reports made of mineral lands. Business attended to thoroughly and promptly. First-class references given.

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Dealer in Charcoal and Coke Pig Iron for Foundry, Forge or Car Wheel purposes.

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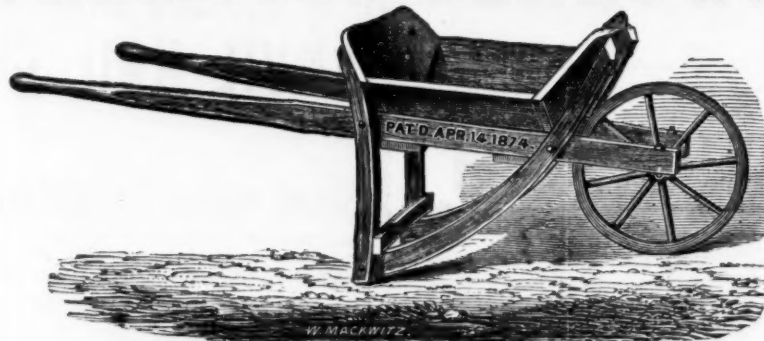
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No. 1 Platt St., New York.

Agent for CLEMENT & MAYNARD,

Great inducements offered in their Superior Shovels, Spades and Scoops and Trowels, as well as Hoes. A large stock on hand.

CHAMPION BARROWS.



WITH WOOD OR IRON WHEELS.

A first-class article and a specialty, that will make a demand in any market and afford a good margin for dealers. W. are prepared to furnish them in large quantities. Manufactured by

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SEMPLE & BIRGE MFG. CO., Sole Western Agents, ST. LOUIS, MO.

For Sale by THE NEW YORK PLOW CO., General Eastern Agents, 55 Beekman St., New York.

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MANUFACTURERS OF

HOT PRESSED

Square & Hexagon Nuts,

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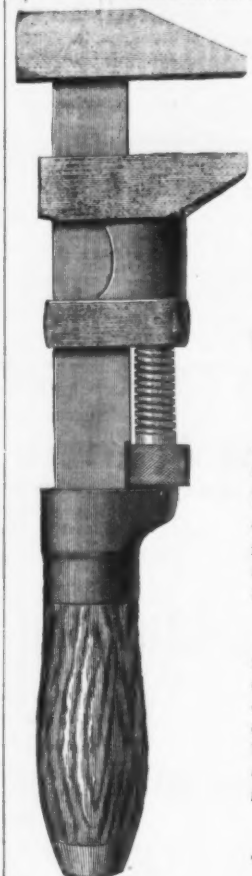
SPIKES,

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STANDARD GIRARD WRENCH.

WARRANTED.



FOR
STRENGTH
AND
Durability
IT HAS
NO SUPERIOR.

GUARANTEED
IN
EVERY RESPECT.

Wrought Bar, Head
and Screw.

Owing to the in-
creased demand
for these justly

Popular Wrenches,
we are now manu-
facturing more than
any other establish-
ment in the world.

Our Wrench hav-
ing been imitated by
other manufactur-
ers, we have adopt-
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Mark, and will here-
after stamp all our
goods.

SEND FOR
TERMS and PRICES.

GIRARD WRENCH MFG. CO., Girard, Pa.

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H Hubbard, Bakewell & Co., A

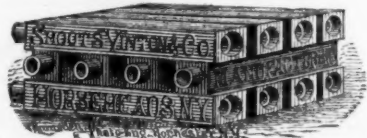
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SHOOTS, VINTON & CO.,

Manufacturers of

Wooden Water Pipe,

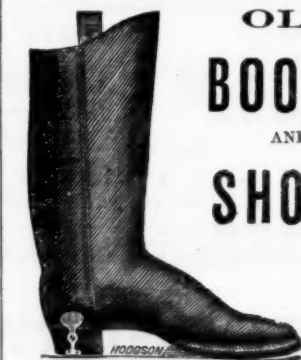
And all kinds of Chain Pump Tubing

(J. D. Shoots' Patent, July 31, 1877.)

J. D. SHOOTS,
C. E. VINTON,
S. H. CONKLING,
R. COLWELL. } **FACTORY:**
Horseheads, N. Y.

The above Patent for sale for all States except
New York and Pennsylvania.

OLD BOOTS AND SHOES



Can be Straightened
AND NEW ONES KEPT STRAIGHT
BY USING

**LYON'S PATENT
Metallic**

HEEL STIFFENER.

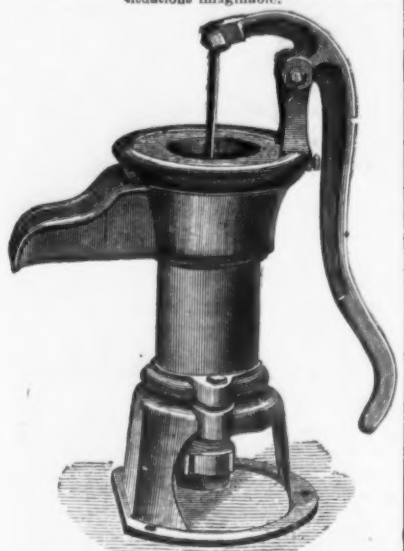
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Stove Repairs.

Repairs for Stoves made at Troy, Albany, Rochester,
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127 W. Rand W. C. METZNER,
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The Largest Pump Works in the World.
Over 800 Different Styles.
**PUMPS, STEAM PUMPS, ROTARY
PUMPS, CENTRIFUGAL PUMPS,
PISTON PUMPS,**
Tanners, Paper Mills, Fire Purposes, suitable for all
situations imaginable.

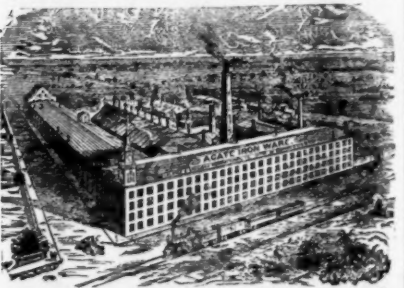


Also, HAND FIRE ENGINES.
Send for Catalogue. Address,
RUMSEY & CO.,
Seneca Falls, N. Y., U. S. A.
Branch House, 93 Liberty Street, N. Y.
MARCUS C. HAWLEY & CO., San Francisco and
Sacramento, Cal., General Agents for the Pacific Coast.
JUSTUS SCHMIDT, Agent, Hamburg.
L. M. RUMSEY & CO.,
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**AGATE
IRON-WARE**
PATENTED
May 30th, 1876, Feb. 27th, 1877, July 24, 1877.



The absolute Purity and Safety of
Agate-Iron-Ware is certified to by the
following eminent Chemists:
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F. SILLIMAN, State Chemist, Yale College, New Haven, Conn.
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S. C. EATON, M. D., Analytical Chemist at U. S. Assay Office,
S. DANAHAY, State Assayer and Chemist, Boston, Mass.
HENRY MORTON, Prof. Stevens Ins. of Technology, Hoboken, N. J.
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Awarded the GRAND MEDAL of PRO-
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This Hinge has two flat coil
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solid pintal, giving much less fric-
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broad, solid bearings in the knuckle,
which do not wear down readily and
let the door sag. It is Fast Joint,
therefore can be used for either right
or left hand. By actual test it has an
average of 50 per cent. more power
than other Spring Hinges in com-
mon use of same size.

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5th. For their first-rate Material and Workmanship.
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possessed by the **HOWE**).

The Improved Howe Scales
MADE BY THE
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Are Guaranteed Superior to all others.

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Origin and Progress of American
Stamped Ware Manufacture.

An interesting phase in the development
of American manufactures is discovered if
we trace the history of stamped tin goods
from the beginning of this industry, some 20
years ago, to the present time. The first
stamped tin pan of American manufacture
was made by Enoch Ketcham at the works
in Williamsburg, L. I., and was considered
at that time a notable achievement, though
the depth of the utensil scarcely exceeded
one inch. Previously we had been importing
from France an article in the rough, made
deeper, to be finished here. The American
inventive faculty was then called into play
to see what could be done with machinery,
not only to simplify and perfect processes,
but to do away with "piece-made" work.
The outcome of this effort was a pan or pail
of almost any desired size or shape, produced
from a single sheet of metal, without
wrinkles or seam and of a character as to
finish surpassing anything of European man-
ufacture. In technical terms we can stamp
a 20-quart pan from I. C. tin, giving it a
depth of 9 inches without annealing, or we
can use a sheet of No. 20 gauge and make a
vessel of any depth up to 14 inches, keeping
the thickness of the metal uniform through-
out. In all cases, of course, the metal is
worked cold. The old-fashioned method
was to allow stamps or drops to fall upon a
circular blank of tin plate with sufficient
force to produce the shape desired
at a single blow. We now have "drawing
presses," by which the sheet is carried down
to the desired depth; from the press it goes
to the spinning lathe for the finish. The
metal comes out slightly corrugated from the
"drawing press" when the work is large
and deep, but the lathe removes all
irregularities. Some presses are drawn by a
cam, others by a walking beam. Unless
they are finely adjusted even copper is torn
to pieces in the process; but by the use of
drawing presses a slow, steady pressure is
brought to bear on a plunger and without a
jar. Until these devices were employed it
was never dreamed that cold sheet metal,
especially iron, could be manipulated with
such results. As might have been antici-
pated, the goods have been popular from
the start, and now hold an important position
among the mechanical industries. So
great is the improvement in drawing and
other presses that tin plates of the ordinary
thickness can be formed in shape at a cost
much below the cheapest soldered goods of
the country craftsman.

In the year 1861 the consumption of tinned
goods was put down at \$150,000 per annum.
To-day one house alone does an annual busi-
ness amounting to \$1,000,000, with fourteen
lively competitors, and the entire business
of the country is believed to equal at least
\$4,000,000 per annum. This is the estimate
of a leading manufacturer, and others con-
cur. It would not be correct to assume that
the demand for tinware has increased in
the proportion which these figures might
indicate, but that there has been undoubt-
edly a displacement of the common descrip-
tions by the improved. The practical effect
is to give the consumer three pieces where
there was one before; or rather, to reduce
prices one-third compared with old times.
The list of manufacturers in the recent trade
organization was 21, of whom 7 are in New
York State, with an average capital of
\$1,000,000, while the average number of
hands may be put down at 400. The largest
number employed in any one concern is
about 600.

The firm hold which stamped tinned goods
have in the popular estimation is shown by
the fact that within the last eight years for-
eign manufacturers have been wholly
crowded out, and goods are sold to-day, not-
withstanding the tariff, at a lower price than
before the war when there was no tariff.
One of our manufacturers remarks that some
if not all would favor absolute free trade, as
they don't need protection and would save
the duty now paid on tin plate.

The tables are so far turned on competitors
abroad that within two years an export
business has commenced, with prospects of
continued growth. Efforts in this direction
have some success in England, Germany,
Austria and Russia, though our most encour-
aging field is in South America and Aus-
tralia, with which countries we have regular
connections. American goods may be seen
in Cape Town, Madras and Calcutta. From
France we are excluded by a prohibitory
tariff.

A gentleman who may be called the veteran
manufacturer in the trade, speaking of the
subject, does not ascribe to the export branch
of the business any great importance, the
various Spanish and South American coun-
tries excepted. It is only within a very re-
cent date that American tinned goods have
been introduced into Europe. Some orders
are coming from Germany. We do not
ship direct to South America, but
through commission houses in New York,
because we can't ship goods without money
in advance. Some few goods are sent by
importing tea houses to China, where they
have succeeded well. England, this gentle-
man remarks, for the last two years has
been importing machinery from the United
States, making identically the same goods
after American methods. This, they might
say, is like fighting the devil with his own
weapons, for the proceeding is well calcu-
lated to give Englishmen exclusive posses-
sion of their own ground. At the same
time the fact is quoted with complacency on
this side of the Atlantic as a tacit acknowl-
edgement of the superiority of American
goods. There is one comfort to be gained
from the fact that by far the largest propor-
tion of the American tools and presses
sent to England were to firms who manu-
facture packages of tin plate for their own
goods. Comparatively few of them have
gone to general manufacturers of tinware.
We are therefore not likely to feel severe
competition for a long time to come. Amer-
ican stamped goods are superior in point of
finish, taste and style. English goods, on
the other hand, are bungling and incon-
venient. The manufacturers are wedded to
patterns that have been in use for
100 years; but they will change now,

so it is predicted, for they have our ma-
chinery. The whole theory in England is
that the buyer must take what the
manufacturer makes, while in America the
manufacturer makes what the buyer wants.
This statement was made publicly by a large
Australian buyer, and a gentleman who has
represented his firm abroad since the begin-
ning of the export movement says it ac-
counts in a large measure for the success of
American goods in foreign markets. It has
been urged that one point against us in Con-
tinental markets is that we do not manufac-
ture tin plates, but have to depend upon Wales
for our supplies of raw material. This is not
true, for we are by no means entirely
dependent upon Wales. A very con-
siderable amount of black iron "stamping
plates" of American manufacture are used
in this country, besides no inconsiderable
amount of American tin plate. But even
with the foreign article we can compete
successfully for the trade of countries near
us—our cis-Atlantic neighbors—where we
have proper facilities for transportation.

As for the present state of trade, it must
be characterized as worse than dull. There
is a fair consumption, but the trade is de-
moralized by bankrupt stocks and other
causes peculiar to the times, and is not re-
munerative. There is no inducement to go
into it, as affirmed by one of the oldest and
most successful manufacturers. There is
nowhere apparent any spirit or enterprise.
Where adequate means are at hand for ex-
perimenting something valuable may be de-
veloped even if money is lost.

**Hardware and Machinery Trade of
Sheffield.**

The returns of the Sheffield Board of
Trade make the following showing of the
state of trade during the last six months:

The exports of hardware show an increase
on the six months of nearly \$171,500, the
values being \$7,644,000 last year and
\$7,815,500 this year. The figures this year
still show a decline of over \$80,000 com-
pared with the first six months of 1876, and
it should be noted that the increase in June
was larger than in any preceding month of
the half-year. The markets which show an
improvement on the six months are Russia,
France, the United States, the Argentine
Republic and Australia. The improvement in
the French and United States markets
are slight, being less than \$400 in the for-
mer and less than \$10,600 in the latter.

The value of steam engines exported dur-
ing the six months rose from \$4,688,000
last year, to \$6,123,000 this year, being an
increase of \$1,435,000. The increase in June
was proportionately much larger, the values
going up from \$605,600 last year, to \$1,162,-
000 this year—an increase of \$556,400 on a
single month. The increase for the six
months was spread over all the leading mar-
kets, with the exception of Spain, Italy
and Australia, and in June there was a slight
increase to Italy; Spain and Australia alone
showed a decrease on the month. There was
an important improvement to note also in
the exports of other machinery. In the first
six months of last year the value was only
\$10,631,000; this year it was \$11,960,000,
being an increase of \$1,329,000. In June
last year the value was \$1,862,000; this
year it rose to \$2,204,000, being an increase
of \$342,000 on the month. The chief in-
crease in the six months was to Russia, Ger-
many, France, Egypt, Australia and minor
markets. In June the Australian market
showed a falling off, but the improvement in
the other markets continued. The exports
of steam engines this year exceed those of
1876 as well as those of last year. In re-
gard to other machinery, this year's exports
are considerably below those of 1876. The
exports of machinery to the United States
are gradually becoming insignificant. They
amounted to \$363,000 in the first six months
of this year, against \$622,000 in the same
period of 1876; last month they were \$39,-
000, against \$103,000 in June, 1877.

Unemployed Labor.—Col. Carroll D.
Wright, chief of the Massachusetts State
Bureau of Statistics, has recently begun an
investigation which promises to be of very
positive value in its bearings on the labor
question in that State. He has undertaken
a systematic enumeration of the unemployed
laboring men of the State. By the term
"unemployed," is to be understood not
those thrown out of work for a few days by
the temporary suspension of operations on
which they are usually engaged, but those
who may be said to be for a considerable
duration of time without work. Can-
vassing by his own agents, Col. Wright has
received returns from 100 places, including
two of our large manufacturing centers.
Should the remaining returns hold with
those already received, it is probable that
the completed canvass will show about
15,000 men out of employment. Of these,
about one-third—say between 5000 and
6000—are skilled workmen, and the balance
unskilled. The latter may be divided into
three classes. Of the unskilled 25 per cent.
are the class who never work when they
can avoid it, 50 per cent. labor more or less,
and the balance really are desirous of em-
ployment. There has been but little call for
out-door relief, either in this city or in the
country towns, and the assessors of the lat-
ter report a very small amount of actual
distress. Reports generally received indicate
the diminution of the number of idle
workers by the starting up of manufactur-
ing this fall. Col. Wright will forward his
completed report to the governor ere many
weeks. Fall River will constitute the sub-
ject of a special document devoted to consid-
eration of the special phases presented by
the condition of its laboring classes. Very
wild reports have been set afloat as to the
extent of unemployed labor—some through
ignorance and others for special purposes.
One statement placed the number of unem-
ployed in Boston alone at two score of
thousand, whereas there is very good reason
to doubt the exaggerated notions which
have got abroad are in great measure
due to the observation of a few men per-
manently out of work, who from being con-
stantly seen, convey an impression of a much
larger number being actually without em-
ployment.



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THE NEW AMERICAN FILE COMPANY have the exclusive right to use the Bernot process for cutting Files. By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing Files and Steel.

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AUBURN FILE WORKS,
Superior Hand-Cut
FILES AND RASPS,
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
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Superior Goods.



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For everything (and every size), from a hat or cap to an exhibition building. Kitchens, Laundries, &c., ventilated without draft. Durable, strong, without rivets or solder. Oiled for six months. Each one has storm cap. Retail price, size six inch diameter, \$1.00 and upwards; apparatus with which any one can cut circles in glass, 15 cents each.

Protective Ventilators avoid drafts, exclude dust, dampness, malaria and germs of disease; adopted by hospitals, schools, institutions, &c.; applied to any window or room. Prof. A. L. Loomis, M. D., University of City of New York, writes as follows: "From my personal experience and that of my patients who have used your Ventilator during the past six months, I am convinced that your method of removing dust, impurities and dampness from the atmosphere is the best which has as yet been proposed. By it the air in an apartment can be constantly changed without causing drafts. I would especially recommend its adoption in sick rooms, sleeping apartments, nurseries and school rooms."

Air Filters and Moisteners, placed over hot-air registers of furnaces, &c., prevent dust and supply steam filtered air. Prices and discounts to the trade sent on application. The "Economy" Molding Weather Strip is perfect in every respect. By enlarging edge of rubber or felt, and making slot in molding to correspond (see engraving), we save all other expense of molding. Once purchased it will last a lifetime, because rubber, etc., has only to be removed by taking old piece out of either end of molding, and sliding in a new piece. By this method of securing rubber all uncertainty of fastening or undoing of glue or tacks is overcome. Rubber supplied with enlarged edge and instructions to enable Car Manufacturers, Carpenters, Builders and far off trade to make slots in Sashes, Doors, Mouldings, &c., and thus make perfect Weather Strips.

No. 6.



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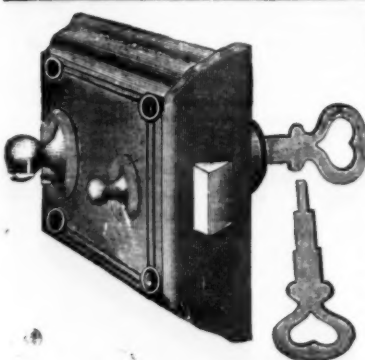
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We have also on hand a general assortment of Hardware



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"DRAW CUT"
BUTCHERS' MACHINES.
Choppers, Hand and Power.
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Warranted thoroughly made and the BEST IN USE.
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No. 10 1/2, Circular Plane, Price, \$4.50 each.
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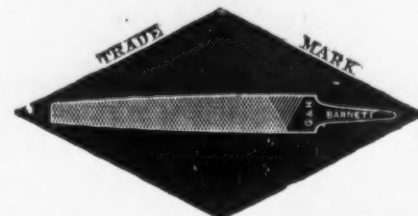
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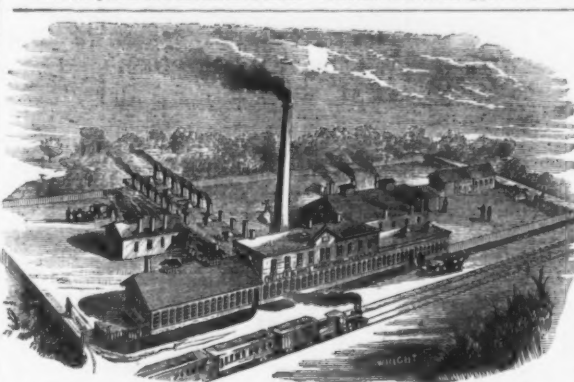


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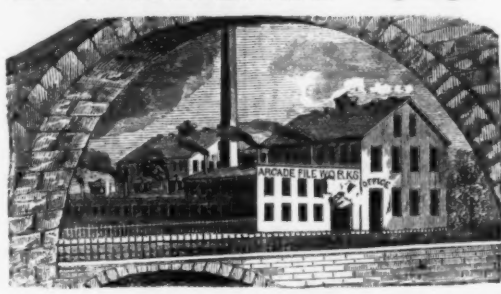
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POLISHED OR BLUED.
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The Ausable Nails

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Thus Imitating the Process of Making Nails by Hand.

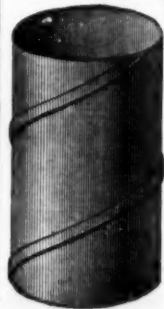
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The Abendroth & Root Manufacturing Company, sole owners of the Letters Patent, and manufacturers under the same, of Root's Spiral Metallic Tubing, grooved and riveted seam, now offer for sale the territory west of the Rocky Mountains, in the United States, and the Letters Patent issued for Canada and all other foreign countries, together or separately, including complete working drawings or machinery (if required) for manufacturing.
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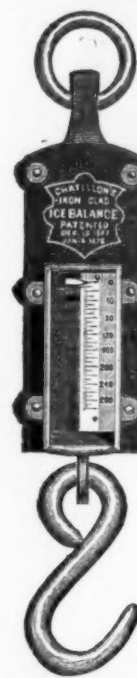
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FINE TEMPERED STEEL SPRINGS,
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From 1/4 inch wide upward. Warranted tougher than
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Of various kinds. Clark's Shutters are the Best
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County Court House, Mt. Vernon, Holt County
Court, Oregon, Mo. Also to buildings in Boston,
Cincinnati, Detroit, Janesville, Wis., Baltimore,
Canada, &c. Have been for years in daily use in
every principal city throughout Europe, and are in-
dorsed by the Leading Architects of the
World.

Office and Manufactory,

162 & 164 West 27th Street, N. Y.

THE PARIS EXPOSITION.

Notes of American Exhibits.

(From our Special Correspondent at Paris).

THE LALANCE & GROSJEAN MFG. CO.
of New York make a large and very in-
teresting exhibit of deep stamped and jap-
anned tin and sheet iron goods, together with
a large variety of their agate iron ware, for
which they claim great durability and clean-
liness as well as standing great heat and
not being corroded by acid of any kind, or
in a word, absolute purity and safety. The ex-
hibit is installed in the same case as at the
Centennial. In the agate ware they ex-
hibit mainly kitchen utensils, such as frying
pans, gridirons, baking dishes, sauce pans,
both lipped and covered, collenders, cake
molds, pie plates, preserving kettles, dish pans
&c. Handsomely contrasting with the gray-
blue and mottled enameled ware is a
beautiful assortment of planished copper
and tin urns, soup tureens, chafing
and oyster dishes, &c. In japanned ware
they exhibit toilet sets in elegant designs,
some beautiful specimens of decalcomanie,
water coolers, japanned tables, jardiniere,
&c. In retinned deep stamped goods they
make a very handsome display, showing
many specimens of deep stamping which
are absolutely marvelous. They also show
a large assortment of tinned and enameled
basting spoons, tinned forks, ladles, both
plain and pierced, copper sauce pans, sugar
scoops, both tinned and brass, brass pre-
serving kettles, tinned and copper tea ket-
tles, tea and coffee pots, and a large variety
of miscellaneous goods in tin, copper, iron
and japanned ware. Their deep stampings
are a marvel to European manufacturers,
most of whom know of them by encountering
them in foreign markets. Their agate ware
is of great beauty. In securing a fine mottling
and a perfect blending of tints and
colors this firm has no foreign rivals. Their
business is the oldest of its kind in the coun-
try, and their works on Long Island the
largest and probably the best equipped.
One of the most attractive exhibits in the
American section in the line of house-
furnishing goods is that of the

GRANITE IRON WARE,

made by the St. Louis Stamping Co., St.
Louis, Mo. This article, though so well
known in the United States, is new to
Europe, and is such a contrast in appearance
to the enameled iron ware used in England
and on the Continent as to at once claim
attention. Most, if not all, of the ware of
this kind in the other sections is heavy, un-
graceful in design and proportions, enameled
only on the inside and without any attempt
at ornamentation. The granite ware, on the
other hand, is light, the form is in every
case graceful, and the beautiful granite
coating or mottling which is its distinguish-
ing feature, and which is both on the inside
and outside of the vessels, gives it a taste-
ful appearance, which is greatly increased
in many cases, as of tea and coffee pots,
casters, tea services, &c., by the use of sil-
ver and nickel-plated bands, handles, bot-
toms, &c. The exhibit consists of a large
variety of articles, not only for the commoner
uses of the kitchen, but for the tea table and
toilet uses. It includes every variety of
pots, pans, kettles, cups, saucers, spoons
and forks for the kitchen; tea and coffee
pots, slop and sugar bowls, casters, fruit
and cake baskets for the dining table, and
ewers and basins, foot tubs, soap dishes, &c.,
for toilet purposes. The granite coating is
an insoluble glaze, vitrified under an intense
heat, and receives the mottled finish from a
liberal mixture of iron oxide. The material
being a non-conductor of heat and cold, this
ware is especially and equally valuable for
keeping beverages at either extreme of tem-
perature. Hence its popularity in ice urns,
pitchers, coffee urns and pots, as well as all
household utensils. The bright and orna-
mental mountings, in contrast with the hand-
somely mottled surfaces, combine to make a
line of ware very pleasing to the eye.

The coating of this ware, of which we have
given an analysis in our columns, is entirely
free from any deleterious substance, and is
altogether proof against vinegar, lemonade or
other vegetable acids, or salt and greasy
substances. The granite iron ware is in fact
a glass combined with the strength of metal.
The company have lately made an important
improvement in the manufacture of these
goods which will prevent all liability to
blister in the heating to fix the enamel.
Though only three years have elapsed since
the first introduction of the granite iron ware,
the annual sales reach \$700,000. The works
extend over three blocks in St. Louis, and
nearly 400 men and women are employed.

LOVEGROVE & CO.,

Philadelphia, have one of their portable en-
gines and boilers in the Machinery Depart-
ment, which they claim to be the perfection
of compactness, simplicity and neatness,
while at the same time it is durable and
cheap. It occupies a floor space of 20 by 34
inches, with boiler 18 by 34 inches, contain-
ing 20 2-inch tubes tested to 200 lbs.,
though the working pressure is 60 to 90
lbs.; steam cylinder, 3 by 4-inch stroke; fly
wheel, 12 inches diameter by 3-inch face.
With these dimensions two horse-power is
obtained. The engine has all necessary ac-
companiments. The steam and exhaust
connections are quite short, saving expense
in pipe and waste of steam. The pulley which
drives the governor affords connection with
the pump at the same time. The vertical
guides are bolted to the base plates and are
fitted up in a plain, substantial manner. The
workmanship is claimed to be the best and
the materials as good as can be obtained. It
is a very cheap portable engine and worthy
of notice.

THE PETERS COMBINATION LOCK CO.,
at Waterbury, Conn., show samples of their
new combination lock, which they are just
putting upon the market. These locks are
constructed on a principle that has never
before been applied to such a purpose, and
it appears simple and very secure. Out-
wardly the lock has a series of pins, the
pressing of which in a certain order,
changeable at will, operates the combina-
tion. Inside the lock is a roller with six

lines of holes running lengthwise, with a
pin for each line of holes. These pins are
screwed into the holes, and by springs con-
nected with the outside pins move the roller
round to the proper place for opening the
lock. Among the claims made for the lock
by the company are the following: They
are machine made, are interchangeable, and
not liable to get out of order; they cannot
be picked, as it is not possible to see, hear
or feel a way to do it; they are the only
combination locks that can be opened with-
out the combination being discovered by
persons who are watching to get it; they
can be operated in the dark as well as in the
light; they are more easily and quickly
operated than key locks; they dispense
with the necessity of carrying a key; in-
numerable changes of combination may be
made by any person of ordinary intelligence.
The lock is made for nearly every use to
which locks are put: Mortise night locks
and latches for front and street doors;
upright rim locks for store doors; rim latch
locks for office doors, &c.; mortise latch
locks for office and house doors; trunk,
chest, drawer and cupboard locks; mortise
desk locks (self-locking) for rolling top
desks and ticket cases; flush desk locks
(self-locking); padlocks and post-office box
locks. The lock is already in use by the
Canadian government in their post-offices,
both in boxes and on the mail bags, and is
giving good satisfaction.

CHARLES F. HENIS

of Philadelphia exhibits an adjustable pipe
elbow and improvement in stove pipes. This
new elbow is adjustable to any degree of in-
clination, from a straight cylindrical shape
to an angle of 90 degrees, and can be rigidly
locked in any desired position or angle of
adjustment. The five sections of which the
elbow is composed are cut at one operation
from a rectangular sheet of metal, without
any loss or waste of iron whatever; the in-
terlocking grooved joints are of such shape
that sheet iron of greater thickness and
strength can be employed than could be
worked into corrugated elbows of the well-
known unadjustable pattern, which requires
a superior quality of iron to withstand the
acute creasing of its corrugation without
cracking. It also offers very important ad-
vantages for shipment, the elbows being put
up in nests of various sizes (from 3 1/2 to 6
inches diameter) in the cylindrical, straight
form, reducing the bulk of packages to the
utmost limit. A very simple and efficient
locking or clamping device is used for secur-
ing the elbows to the straight pipe sections,
as well as for fastening any number of
straight sections to each other. This mode of
fastening prevents any undue loosening or
separation of the pipes, while they are very
easily taken apart for cleaning and as easily
put together by the most inexperienced per-
son. Messrs. Hammer & Fanché, of Reut-
lingen, Germany, are at present the only
manufacturers of these new elbows in Eu-
rope. The special machinery of the Phila-
delphia establishment manufacturing this
pipe was made by Messrs. Bliss & Williams,
of Brooklyn, N. Y., and has been duplicated
by them for the above-mentioned European
branch.

MESSRS. CLOUGH & WILLIAMSON,

Newark, N. J., exhibit their wire cork rings
and the automatic machine for making the
same. Their cork ring is a very simple de-
vice, not only for extracting corks or stop-
pers for bottles, but serving as a handle to
withdraw the cork afterward. The rings
are made from tough thin wire, are very
strong and will not injure the cork. Some
patent medicine manufacturers put one of
these rings inside of each bottle that goes to
the trade; one manufacturer has lately given
a single order for 10,000 gross. The ma-
chine by which they are made is a very
pretty piece of mechanism. A piece of wire
of the right length to make a ring is fed into
the machine; it is doubled to make the ring
for the handle, and the worm then takes one
strand of the wire and forms the worm or
screw, while at the same time the other
strand is turned as a guard below the ring
to prevent screwing the ring too far into the
cork. This machine is another illustration
of the readiness of our mechanics to adapt
machinery to special purposes.

LLOYD, SUPPLEE & WALTON,

Philadelphia, Pa., exhibit one of their Penn-
sylvania lawn mowers. It is claimed for
this machine that it combines all the points
necessary to a perfect lawn mower, being
light, durable, with great strength of parts,
of light draft and very easy of operation.
The handles are made of tubular iron, giving
great lightness and strength to this impor-
tant part of the mower. The heads of the
cylinders and the nuts, bolts, &c., are made
of wrought iron. Three sizes of machines
are made, as follows:

Length of Knife.	Diam. of Rolls.	Weight.
12 inches.	8 inches.	33 1/2 lbs.
14 "	8 "	34 1/2 "
16 "	8 "	36 1/2 "

The lightest can be used by a child, the
second size by a woman and the heaviest is
for men.

THE CHARTER OAK LAWN MOWER

is exhibited by Markt & Co., 139 and 143
Center street, New York. Seven machines
in different sizes are shown. The peculi-
arity of these mowers is the use of driving
wheels in the place of rollers. It carries the
regular gearing of a roller machine, which
is beautifully and substantially inclosed
within its side frame, a point necessary for
durability as well as to prevent clogging of
the gears. The machine is mounted on two
large driving wheels, or pulleys, and instead
of being on the outside of the frames, to run
in the uncut grass like all other wheel mow-
ers, they are placed inside the frames back
of the cutting blades, running on a shaft,
each independent of the other, allowing the
machine to be turned either to the right or
the left without injury to the sod, and to be
turned around in a circle no greater than its
own length, and cutting at the same time.

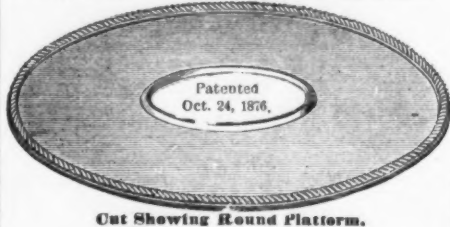
It is also provided with a neatly con-
structed iron handle, which, being adjust-
able, can be raised or lowered at the con-
venience of the operator, allowing the ma-
chine to adapt itself to the inequalities of
the ground without losing power, and at the
same time to make an even and level cut.
One very important feature is its three-
bladed solid revolving cutter, working in
patent boxes, so constructed that grass can-

ANSONIA CORRUGATED STOVE PLATFORM

Manufactured by the

Ansonia Brass & Copper Co.

Office, 19 & 21 Cliff Street,
NEW YORK.



Out Showing Round Platform.



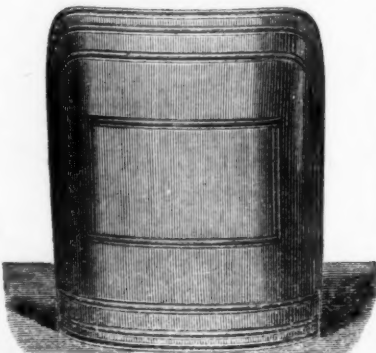
Section Showing Edge.

ANSONIA Bronzed Fire Screen,

With Ornamented Mouldings.

PATENT APPLIED FOR.

The Portable Bronzed Fire Screen or
Shield, as shown in the illustration, is especially
designed for the safety and protection of walls, fur-
niture, woodwork, paper or varnish from heat.
Being constructed of metal, with firm and substan-
tial edges, curved in form to stand alone, it may be
easily adjusted to any position about a stove, before
a grate or fire place. The demand for something
useful, durable and ornamental as a Fire Screen has
long been felt, and having finally accomplished the
desired result, we are prepared to fill all orders
promptly.



CHAINS UNION CHAIN WORKS, REITER & MORTON, Pittsburgh, Pa.

Manufacture all kinds of

Coil, Cable, Crane, Railroad, Wagon and Agricultural Chains,
From Best Standard Brands of Iron.

Our Chains are all thoroughly tested and warranted, and will be found equal to the
best of either home or foreign make.

Prices the very Lowest.

PHILIP S. BIGLIN.

Successor to W. F. SHATTUCK & CO.,

Manufacturers' Agent for

AMERICAN HARDWARE,

100 Chambers St., New York.

Shattuck's Union and Counter Scales,
Phelan's Axes, Hatchets, Picks, &c.
Wellman's Gimlet, Gimlet Bits, &c.
Griswold's Augers, Auger Bits, &c.
Gilroy & Co.'s Stocks and Dies.
Yaw's "Genuine" Wrought (Low Bell).
Horton's Hand and Sleigh Bells.

Maltby's Britannia and Cocoon Dippers.
Eddy's Refined Lamp Black.
"Eagle" Axe, Pick and other Handles.
"Eureka" Flint, Sand and Emery Papers.
Cornland Forged Horse Nails.
Tackle Blocks, Spokes, &c., &c.

DARLING, BROWN & SHARPE

Providence, Rhode Island,

MANUFACTURERS OF

United States Standard Rules,

AMES' UNIVERSAL SQUARES,

Patent Hardened Cast Steel Try Squares,

THE AMERICAN STANDARD WIRE GAUGE,

Bevel Protectors, Hardened T Squares and Bevels, Center Gauges,

Steel, German Silver & Boxwood Triangular Scales, Vernier

Calipers, Caliper Squares and Rules, Plumb Bobs,

Paper Drawing Scales, Willis' Odontographs, Steel Straight Edges,
and T Square Blades.

MEDALS AWARDED: Paris Exposition, 1867; Vienna Exposition, 1872; Philadelphia, 1876.

Illustrated Catalogue sent per mail on application.

RUSSELL & ERWIN MANUFACTURING COMPANY

Manufacturers of HARDWARE.

FACTORIES, - - - NEW BRITAIN, CONNECTICUT, U. S. A.

MANUFACTURERS' AGENTS AND DEALERS IN GENERAL HARDWARE AT OUR

WAREHOUSES: NEW YORK, 45 & 47 Chambers Street; PHILADELPHIA, 425 Market Street; BALTIMORE, MD., WM. H. COLE. Agent, 17 South Charles Street.



Screw Factory.

Packing Room, Offices and Main Factory.

Finishing Shop.

Iron Foundry.

WORKS OF

THE RUSSELL & ERWIN MANUFACTURING COMPANY,

NEW BRITAIN, CONNECTICUT, U. S. A.

IRON AND BRASS WOOD SCREWS.

Our Screws are always for sale at LOWEST prices made by responsible manufacturers.

We do not guarantee prices.

ASSORTMENT COMPLETE, ORDERS FILLED PROMPTLY.

Cutlery.

FRIEDMANN & LAUTERJUNG,

Manufacturers of PEN AND POCKET CUTLERY.

Solid Steel Scissors, Shears, Razors,
Russia Leather Straps, Hones, &c.

"ELECTRIC RAZORS,"

And the celebrated "ELECTRIC SHEARS." Nickel Plated
Howe.

Agents for the BENGALL RAZORS.

AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.

91 Chambers and 73 Reade Sts., N. Y. 423 N. Fifth St., ST. LOUIS, MO.

MERIDEN CUTLERY CO.

The Oldest Manufacturers of Table Cutlery in America.

THE "PATENT IVORY" HANDLE TABLE KNIFE.

EXCLUSIVE MAKERS OF THE

CELLULOID

HANDLE FOR TABLE CUTLERY. A most beautiful and perfect substitute for Ivory. Also makers
of all kinds of TABLE, BUTCHER AND HUNTING KNIVES.

Illustrated catalogues with prices sent to the trade on application. 49 Chambers St., New York.

THE
LAMSON & GOODNOW
88
CHAMBERS ST.
MFG. CO.
N.Y.
GARDNER'S PATENT
AMERICAN TABLE
CUTLERY & C.

NAUGATUCK CUTLERY CO.,

Manufacturers of FINE PEN & POCKET CUTLERY.

FULLER BROS., Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

STANLEY RULE AND LEVEL CO.,

MANUFACTURERS OF

Improved
Carpenters'
Tools.

FACTORIES,

New Britain, Conn.

WAREHOUSES,

29 Chambers St.,
New York.

Cutlery.

McCOY & CO.,

SUCCESSORS TO

Van Wart & McCoy,

Importers & Commission

Merchants.

Hardware, Cutlery, Sad-

dlery, Metals, &c.

134 and 136 Duane St., New York.

Cutlery.

JOSEPH S. FISHER,

No. 411 Commerce St., PHILADELPHIA

AGENT FOR

George Wostenholm & Son,
"Limited."

Washington Works, SHEFFIELD,

Celebrated I-XL Cutlery, Razors, &c

AGENT FOR

WALTER SPENCER & CO.,

Steel and File Manufacturers,

Rotherham, ENGLAND.

Corporate Mark.

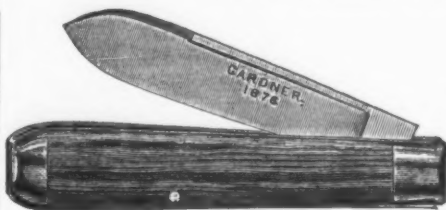
NO SPENCER
ROTHERHAM

Granted 1777.

HERMANN BOKER & CO.,

101 & 103 Duane Street, New York,

SOLE AGENTS FOR THE

GARDNER PATENT
POCKET KNIVES

All of Gardner's Patent Knives are fully warranted.

ESTABLISHED 1853.



AARON BURKINSHAW,

Manufacturer of Pen and Pocket Cutlery, Pepperell, Mass.
My Blades are forged by hand from the best Cast Steel, and warrant-
ed. To me was awarded the Gold Medal of the Conn. State Agricultural Society.

THE SWIFT MILL.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of
our manufacture, especially adapted to Grocers' use and all retailers
of coffee. They are highly ornamental, and workmanship of the very
best. We make more than 30 styles.

ALSO LANE'S PORTABLE COFFEE ROASTER

Will roast 30 to 40 lbs. at once, and can be used as a stove at other
times. Send for descriptive list to Manufacturers.

LANE BROS., Millbrook, N. Y.

Also sold by leading wholesale houses.

Our agents, Graham & Haines, 113 Chambers St., New York,
carry a full line of our goods, and will be pleased to serve you at Fac-
tory prices.

CORPORATE MARK,



Joseph Rodgers & Sons'

(LIMITED)

CELEBRATED CUTLERY,

No. 82 Chambers Street, New York.

F. & W. CLATWORTHY, Agents.

The demand for Joseph Rodgers & Sons'
productions having considerably increased, they
have, in order to meet it, greatly extended their
Manufacturing Premises and Steam power.To distinguish Articles of Joseph Rodgers
& Sons' Manufacture, please to see that they bear
the Corporate Mark.

ESTABLISHED 1852.

NEW YORK KNIFE CO.

MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,

WARRANTED TO BE MADE OF THE BEST
MATERIAL.

WALKILL RIVER WORKS,

Walden, Orange Co., New York.

THOS. J. BRADLEY, President.

ALFRED H. HILDICK,

12 Warren St., N. Y., Importer of
Birmingham Heavy Hardware, Chains,
Anvils, Vises, &c.

Agency of HILL BROS. & CO., WALSALL, ENGLAND

GENERAL HARDWARE MERCHANTS,
And of

Ball's Pat. Solid Steel Sheep Shears.

These Shears are unsurpassed for cheapness, durability
and utility. They are made of one solid piece of
steel from point to point, and cannot be broken in use,
either in the bow or at the junction of back and blade.
Samples can be seen at above address, or sample lots
furnished. Depot for "THE CROWN" SOLID BOX
VISES. A cheap and excellent Vice.

KRAUSS & HAHN,

Importers, Manufacturers and Dealers

In all kinds of

Cutlery and French Grindstones,

152 Centre, cor. Walker St., N. Y.

Ground sides Razors of all brands imported and
concealed by steam power for the trade. Price for
concealing from \$2 to \$5 per dozen. Price list sent on
application.

not wind around the shaft of the cutter,
which overcomes a serious objection in lawn
mowers with skeleton knives. The revol-
ving cutter is provided with steel cutting
edges, which can be replaced when neces-
sary without the expense of buying a new
knife. This machine is made in five sizes
for hand-power, viz., 8, 10, 13, 15 and 18
inch cut, and two sizes for pony and horse,
viz., 28 and 32 inch cut. They are well
made and handsomely finished, and the
driving wheels being inside the frames en-
able the operator to cut the grass clean
around walks, flower beds, &c., which is an
advantage that cannot fail to commend this
machine to practical people.

CHADBORN & CALDWELL MFG. CO.,
Newburgh, N. Y., make a very handsome
and complete exhibit of their Excelsior lawn
mowers, some 14 in number. The machines
exhibited are, with one exception, for hand.
The exhibit includes both mowers and mow-
ers and rollers combined, which have the usual
finish as supplied to their trade with one ex-
ception, which is elegantly finished in gold
and nickel. There is also a large one-horse
mower and roller combined. They claim
for the Excelsior over other mowers that "it
runs lighter; it cuts the borders; it cuts
higher grass; the gears are perfectly cov-
ered; it rolls the ground; it needs less re-
pairs; its adjustments are more simple, and
the roller does not run in the standing
grass." Regarding their new Excelsior
horse lawn mower they say: "In the con-
struction of our new horse lawn mowers
only the very best material is used, and the
design is such as to combine the greatest
possible strength with lightness of draft and
perfect working qualities. The gears are
perfectly covered, like those of our hand
mowers, and, therefore, becoming clogged
with grass or dirt is simply impossible. We
manufacture four sizes of this new horse
mower, enabling us to supply the wants of
those having small lawns, as well as those
having more extensive ones. We con-
fidently make the claim of manufacturing the
most perfect horse lawn mower in use."

Affairs of the New York Belting and
Packing Company.

At a meeting of the creditors of the New
York Belting and Packing Co., held yester-
day morning at the law office of Mr. E. N.
Dickerson, Tryon Row, there were present
about thirty gentlemen, including several
from Boston. Mr. Dickerson called the
meeting to order and Mr. Geo. G. Haven
was appointed chairman. After explanatory
remarks from Mr. Dickerson a statement
was submitted from Mr. Durant and Mr.
Cheever, representing the New York com-
pany. The session being private Mr.
Cheever, in reply to our reporter after
the meeting—the session occupying a little
more than an hour—said that the company
intended to pay all their debts in full, with
interest. All they wanted was clemency.
With time every obligation would be met.
The assets amounted to \$939,907.22 over
and above their debts. The bills payable
were \$619,710.56, held by banks and
merchants in Boston and New York.
Accompanying the statement was a propo-
sition to pay in eight installments, as fol-
lows: Sept. 1, 10 per cent.; in three months
10 per cent.; in six months, 10 per cent.,
and the remainder in equal amounts at 12,
18, 24, 30 and 36 months. Other parties
being interrogated remarked that there was
no expression of individual opinions, but the
fact that all parties signified a readiness to
accept the proposition before them was
evidence on their part that the report made
was favorable beyond expectations. But
Messrs. Durant and Cheever uniting in a de-
sire to have their statement verified by a
competent committee before proceeding fur-
ther, a committee was at once appointed to
report next Tuesday. Their names are as
follows: E. H. Amidown, of the Mechanics'
and Traders' Bank, Boston; J. Gilbert, of
the Market Bank, Boston, and D. C. Hodges,
of the firm of Blackman & Co., Boston. As
showing the friendly disposition of the em-
ployees in the company's factory at New-
town, Conn., the fact was stated that they
had offered, through Mr. Cheever, to con-
tribute their services for two months if it
would help the company in their embarrass-
ments. The wages they receive amount to
about \$10,000 per month.

The New York Plow Company.—We
learn that the New York Plow Co., whose
works at Newark were destroyed by fire,
have leased the extensive property at Yonk-
ers known as the Clipper Mowing Machine
Co., including two and a half acres of land
and a 200-horse-power engine, intending to
resume manufacturing at the earliest day
possible. They have an entirely new equip-
ment of tools and machinery, made by Geo.
Place and Wm. Chase, of this city, at a cost
of about \$15,000. They have heretofore
employed about 200 men, and now will have
a larger capacity than before. Their re-
moval is much regretted by the citizens of
Newark.

Particulars have been received of the
ceremony of opening the Empress bridge
over the Sutlej, in India. It is described as
a magnificent piece of engineering, consist-
ing of 16 spans, each 250 feet long, and is
the completion of one of the principal links
of a vast chain of railway communication
now in course of progress. The cost of erec-
tion has been about 59 lacs of rupees. After
a service by the bishop of Lahore, Sir An-
drew Clarke, in the name of the viceroy,
declared the bridge open for traffic. At a
public breakfast given in honor of the cere-
mony, Sir Andrew Clarke said in the course
of his speech that 16 years had elapsed since
Mr. Brunton, the engineer, pitched his camp
and collected his forces in that then desolate
spot, having a task to perform not less vast
than that which mighty Alexander undertook
when with his hosts he crossed the Ravee
and the Chenab, and came to this very site
to move his legions across the river for the
conquest of India. In bridging the Sutlej
there had been accomplished a task which
baffled the great conqueror, who was forced
to retire from the Sutlej and thus to aban-
don his golden scheme of conquest. Great
and interesting engineering difficulties had
been conquered, chief of all the vagaries of
the Sutlej itself, which was a very Bohemian
in its nature and an Ariel in its eccentricities.

HALL, ELTON & CO.,

Electro Plated Ware, German Silver and Britannia Spoons.



THE "ORLEANS."

Factories, Wallingford, Conn.

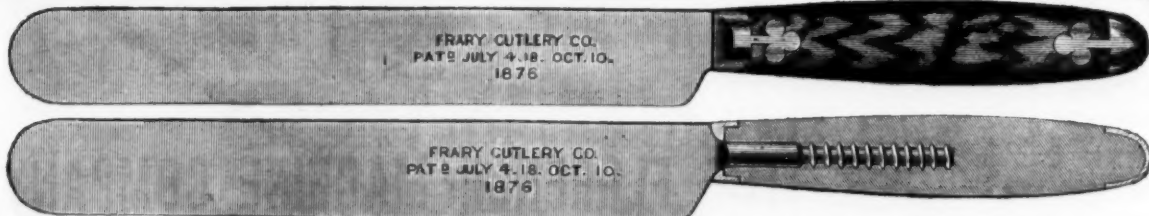
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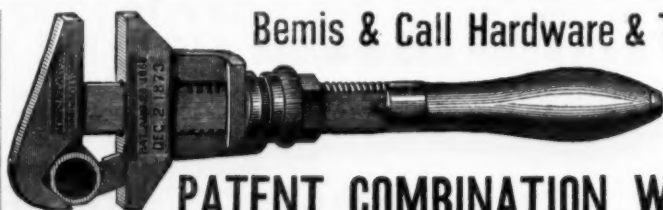
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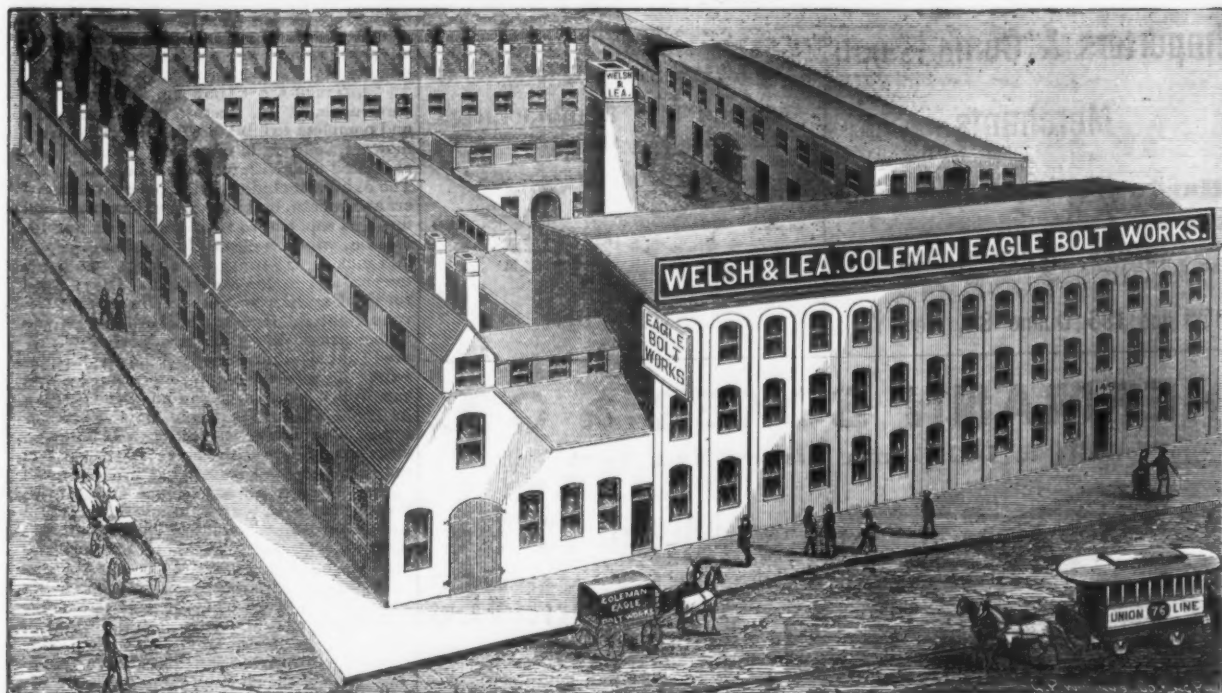
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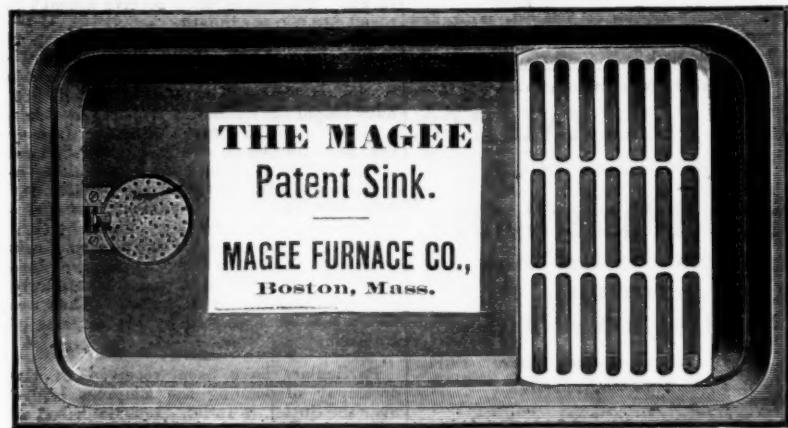
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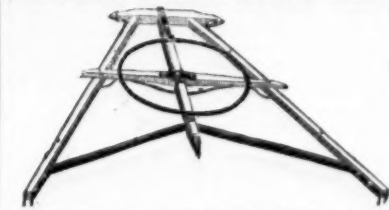
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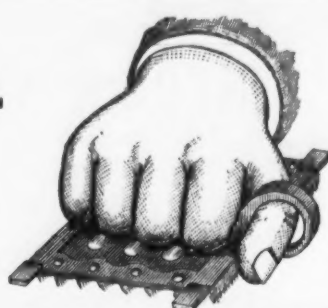
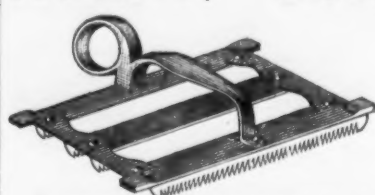


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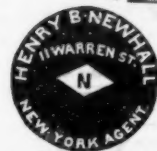
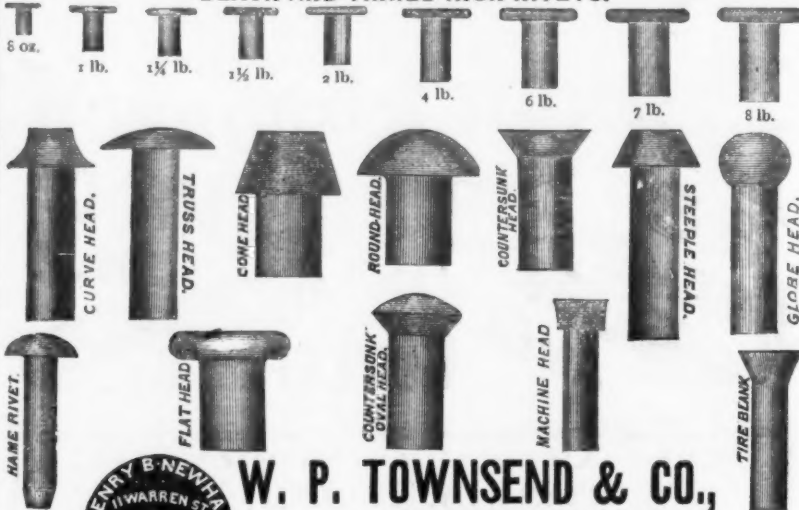
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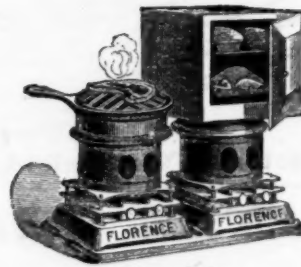
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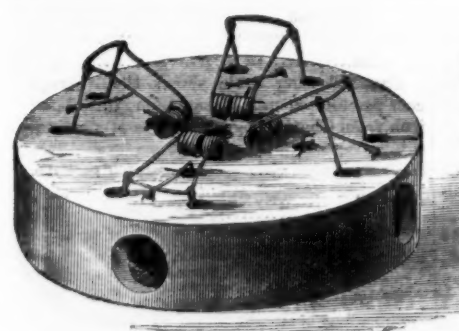
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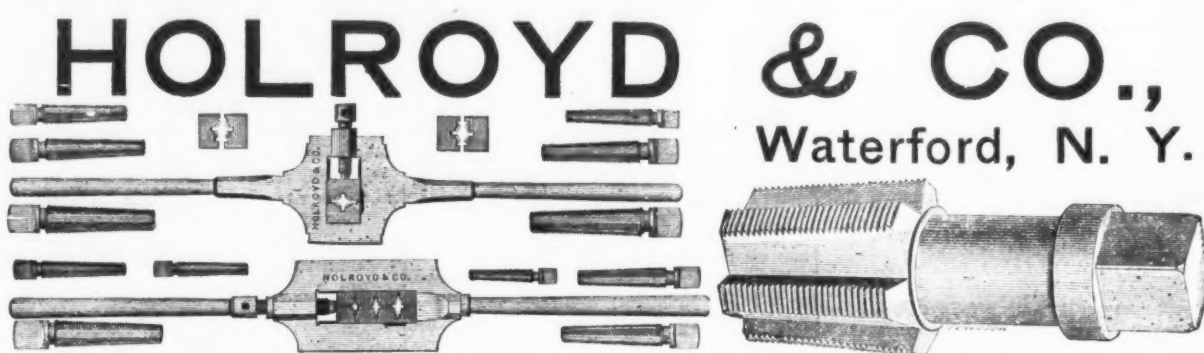
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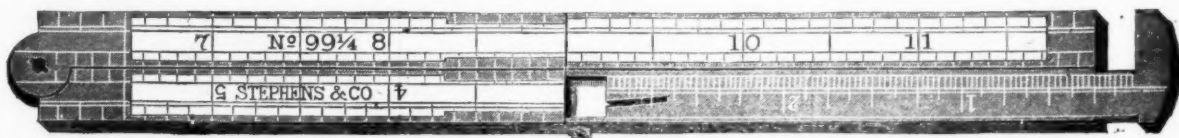
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The Iron Age.

AND
Metallurgical Review.

New York, Thursday, August 1, 1878.

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Forty-first Page.—Boston and St. Louis Hardware and Metal Prices.

No doubt there has been and still is much suffering among the working classes of this country. Wages are low, and families accustomed to comparative comfort often find it difficult to live upon their lessened incomes. It is also true that large numbers of men cannot get the kind of employment they desire, and sometimes can find nothing to do;

but the 24,000 strikers think otherwise and announce their determination to "hold out" until the advance demanded is conceded. Probably they will succeed in holding out until they have reached the conclusion that their best plan is to go to work on whatever terms employers may choose to offer. In the mean time the madness is likely to spread. The strike is already general in the Old Hill, Dudley, Rowley and Hale's Owen districts, and at last advances the Bloomsbury and Blackheath nailers had resolved to join the movement.

Our Export Edition.

The cover, printed in French, which accompanies this week's issue of *The Iron Age*, is intended to give our journal greater value for European readers, for whom we publish a large edition. It gives a summary of the contents of our advertising pages, with the exception of a few advertisements received too late for translation.

Unemployed Labor.

Shortly before adjournment the House of Representatives, on motion of Mr. Thompson of Pennsylvania, passed the following resolution:

Whereas, Labor and the productive interests of the country are greatly depressed and suffering severely from causes not yet fully understood; and whereas our real and permanent property is founded and dependent upon labor as the source of all wealth, that when labor suffers from any cause which may be removed or its rigor mitigated, our national harmony and prosperity are thereby imperiled; that it is therefore the solemn duty of Congress to inquire into and ascertain the causes of such prostration and devise proper measures for their relief, that labor may be restored its just rights, to the end that labor and all our varied interests may be encouraged, promoted and protected by liberal, just and equal laws; therefore,

Resolved, That a committee consisting of seven members of this House be appointed, whose duty it shall be to inquire into and ascertain the causes of general business depression, especially of labor to devise and propose measures for relief, and that to enable said committee to perform its important duties hereby conferred, it has leave to sit during recess, to employ a clerk and such other assistance as may be needed to examine witnesses, and to report at next session the result of its investigations and the measures for relief it may recommend, by bill or otherwise.

The preamble above given is rather absurd as a piece of literary composition, but the resolution is well enough, and defines with sufficient clearness the direction and scope of the proposed investigation. The Speaker appointed Messrs. A. S. Hewitt of New York, H. G. Riddle of Tennessee, H. L. Dickey of Ohio, J. S. Jones of Alabama, J. M. Thompson of Pennsylvania, W. W. Rice of Massachusetts and Thos. A. Boyd of Illinois, a committee to undertake the work. Unfortunately, however, no appropriation was made to cover the expenses of the committee, but Mr. Hewitt hopes to get them to go to work by becoming responsible for the expenses, in the expectation of reimbursement from the committee of accounts.

We are interested in the matter for the reason that such a committee, if it should go properly to work, could gather a great deal of useful information which would probably correct many popular misconceptions of the actual condition of the working classes of this country, and the number of people desiring work who are unable to get it. Without any doubt the number has been greatly overestimated, and if those voluntarily idle and leading by preference a vagrant life as tramps and mendicants could be left out of the count, the total number of those fitted for any form of useful work who can find nothing to do would probably be vastly less than is commonly supposed.

The only facts at hand on this subject are those furnished by Mr. C. D. Wright, chief of the Massachusetts Bureau of Statistics of Labor, who is conducting a laborious investigation into the conditions of labor in that State, chiefly with a view to refuting the statement that it had 150,000 unemployed mechanics. This investigation is not yet fully completed, but from data already accumulated Mr. Wright felt justified in stating, in a public speech delivered in Boston a few days ago, that the number of unemployed men in Massachusetts is less than 20,000. Probably there are less than 10,000 men above the age of eighteen desiring to labor who are not in some occupation. The number of unemployed women is not reported, but it is much smaller than that of men; and in all Massachusetts, with its population of 1,650,000, it is probable that 14,000 is the extreme limit of the number of adult persons of both sexes unemployed that are able and desirous to labor. Of course there are two or three times the number who would get a better paid occupation if they could; but most of the people are supporting themselves with economy, and their condition is growing better rather than worse. This is seen in various ways. The savings bank panic of last winter, for which there was some occasion, has come to an end, and the deposits have not been very much reduced, while of the money drawn out a great deal has gone either into government bonds or into small purchases of real estate upon favorable terms. The burden of pauperism, which has been heavy in former years, is this year sensibly diminished, and the trades dependent upon small purchases are manifestly improving.

No doubt there has been and still is much suffering among the working classes of this country. Wages are low, and families accustomed to comparative comfort often find it difficult to live upon their lessened incomes. It is also true that large numbers of men cannot get the kind of employment they desire, and sometimes can find nothing to do;

but most of the latter belong to the class which, in the best of times, maintains a precarious, hand-to-mouth existence. Granting all that can properly be claimed as the legitimate effect of depression and stagnation, the fact remains that, as a people, we are being deceived by the appearance of vastly more suffering than really exists. Wholesale pauperism is a new thing with us. Our sympathy for those who plead hard times as an excuse for vagabondage is so strong that we fail to appreciate the terrible evils which the rapid growth of this vice must necessarily entail upon all classes of society. If Congress can do anything to open our eyes to the actual state of the case it will render the country a valuable service.

In every community there is a very large class which naturally gravitates into vagrancy upon slight provocation. It is the substrata of city populations chiefly, and is largely composed of ignorant persons of both sexes, more or less addicted to vices that destroy their ambition and unfit them for usefulness in life. Many are graduates from jails and penitentiaries, and many fall to this low level through sheer laziness and utter worthlessness. Nothing but a nucleus is needed for the recruiting of a vast army of these vagrants, and such an army we now find scouring the country as tramps, moving singly, in couples or in droves as inclination prompts. In summer they swarm into the agricultural districts, living largely on the plunder of the country through which they pass; in winter they creep back into the cities to subsist by mendicancy or upon the public charities which are always found in operation in the great centers of wealth and population. We can scarcely class this element as unemployed labor without doing the honest workingman injustice. Not one per cent. of the whole number of vagrants now infesting the country would take the kind of work they are able to do if it were offered to them. They despise industry, but they thirst, believe that property is robbery, and are willing to live on the dog's portion if it can be obtained without labor. Where we make our mistake is in supposing that this class is in any sense a legitimate and necessary outgrowth of the depressed state of our industries. Were every branch of productive and distributive industry suddenly quickened into full activity, and labor again in demand at better wages than at any time during the past ten years, but few of these vagabonds and mendicants would be absorbed into the busy ranks of the workers. They have eaten the bread of idleness and found it sweeter than the bread earned by honest toil. In a word, we have now a class of professional vagrants and mendicants larger than ever before, and it will grow and spread like a plague until we are prepared to stamp it out resolutely and mercilessly. So long as there is any place where the vagrant can exist unmolested, there we shall find him; when he can live nowhere without visible means of support he will disappear.

Vagrancy and mendicancy are crimes against society. When from any cause men or women are found dependent upon charity they become a public charge, and should be so disposed of that, in return for their maintenance, they can be made to render the largest equivalent in the shape of useful work of which they are capable. Sympathy with poverty and suffering does not find its best expression in almsgiving or the encouragement of pauperism. We may pity the miserable beggar or the able-bodied vagrant, but every consideration of self-protection and the welfare of society demands that we place the one where he will be better off than in the streets, and the other where his example will not encourage others to lead a vagabond life. We pity lepers and persons suffering from malignant diseases, but there is none the less need of separating them from their fellow men to the end that others may not be contaminated. Count Rumford solved the problem of suppressing pauperism and mendicancy in Belgium two centuries ago, and the means by which he accomplished it are the only ones now open to us by which to rid ourselves of a curse that is every year assuming more formidable proportions.

England's New Responsibilities.

Now that the people of Great Britain are through celebrating the achievements of Beaconsfield in the Berlin Congress, and the acquisition of Cyprus is an old story, they will probably have time to consider whether they have not shouted louder and thrown their hats higher than the facts of the case will fully warrant. To a nation deriving so large a share of its greatness from foreign possessions and colonial dependencies, the extension of its domain in the East is naturally desirable. It is well to consider, however, whether the advantage derived from Beaconsfield's policy is worth what it is likely to cost. By the terms of the secret treaty of June 4th the British government assumes an enormous responsibility. This involves, practically, the duty of protecting, controlling, and perhaps administering the political and material affairs of all of Turkey in Asia. This geographical division of Asia includes an area greater than the aggregate territory of France, Spain and Austria. It has a population of something over 16,000,000 of half-civilized people, misgoverned to a degree scarcely known elsewhere, oppressed by irresponsible rulers and surrounded by formidable enemies on every side. To defend this territory in perpetuity

against all dangers from without, and prevent its division by civil strife originating within, is a task which a less daring political adventurer than Beaconsfield would have hesitated to assume on behalf of a government having its seat of power some two thousand miles distant, and already burdened with responsibilities disproportionate to its naval and military resources. Commenting on this the *London Spectator* of recent date says:

If Russia, five years hence, recommences her secular march southward, the British people must drive 60,000,000 of Slavs back upon their deserts. If France is irritated with the loss of her influence in Syria, or considers her clients in the Lebanon ill-treated, England must forbid her interference, as an act of hostility to herself. If Persia, under a warlike Shah, redemands her holy places and reoccupies them, the Indian government must declare war on Teheran, in the interest of Turkey. If the Arabs, weary at last of subjection to an equally Mohammedan but inferior tribe, attempt to vindicate their independence, British troops must occupy Mecca or stand prepared to defend Damascus against the assaults of the Desert tribes. If the Armenians of Erzeroum rise on their secular oppressors, English soldiers must be landed at Trebizond, or if Syria once more casts out the Turk, Englishmen must replace him if the remainder of the world, irritated by a massacre in the Holy Places, appears in arms to forbid.

It is to be hoped that the labors of the Berlin Congress prepared the way for a long peace, but it cannot be a permanent peace under the most favorable conditions. Russia has been deprived of much of the advantage she claimed as the fruits of a victorious war against her ancient enemy, and no one supposes she is content. Her ambition will not be satisfied until the dream of Peter the Great, which has influenced the policy of every successor on the Russian throne, is realized. She must now become a permanent enemy of England, only awaiting a favorable chance to set at defiance her guaranty and once more seize Turkey by the throat. French jealousy will not grow less as time passes, and France may insist upon interfering when such interference will be most inconvenient for England. The suspicions of the Mediterranean powers are not likely to be allayed, and a hundred contingencies may arise to menace England and force her to acts which will plunge all Europe into war. Is the British government able to assume this responsibility, and could she make good her guaranty in case the necessity is forced upon her? Her permanent military organization is not large; she has already forty colonies to defend which do not furnish her troops, and the time may come when her Indian possessions will prove a source of weakness rather than of strength. The future of the British empire is thus fraught with possibilities which must bewilder the thoughtful Englishman who stops to think what the statesmanship of Beaconsfield may lead to when his brilliant and wonderfully successful career is ended, if not sooner. In this instance he has doubtless yielded to the necessities of the moment and won much glory thereby. Whether his success may not lead the nation into emergencies which cannot be met and from which there is no escape, is just now a pertinent inquiry.

Tin.

The course of the world's tin markets has of late been unfavorable to holders and producers, and since the commencement of the year prices have declined materially, both in Europe and this country, notwithstanding the rather increased consumption. It will therefore be of interest to examine into the causes which have operated to bring this about.

The metal had declined so considerably during the past four years that it had been hoped a good many mines would either curtail their output or cease producing altogether, or that unprecedented cheapness would so enlarge the sphere of usefulness of tin as to lead to an increased consumption sufficiently large to counteract the growing abundance. These hopes have been disappointed thus far, for there has been no reduction of production and but little increase of consumption. On the contrary, the production has steadily increased, even in Cornwall, and a new and important source of supply has been added during the past twelvemonth by the discoveries in Tasmania, formerly called Van Dieman's Land, a large island to the south of the Continent of Australia. Consumption, it is true, has increased, especially in the United States, but not sufficiently to prevent a further accumulation of stock at London and other points in Europe. Commercial and industrial developments during the past five years have checked consumption, but the cheapness of tin has led to its substitution for other metals in many branches of manufacture, and considering everything it cannot be denied that tin has in this respect done remarkably well.

Another circumstance has kept down the price of tin—we mean the great change wrought by the Suez canal and the establishment of steamship lines by that route between the East and Europe. Added to this there is the cable facilitating the transmission of orders, and between the one and the other the large consumer of tin has ceased to be as dependent as in years gone by on the great centers of supply in England and Holland. With ordinary foresight he can have a steady supply now, although he may have to draw it direct from Java or Singapore. Besides this there is the well-regulated system of the so-called "futures," or of purchasing tin shipped or about to be shipped, in which the operator can deal by availing himself of the facilities offered him by the East India agencies at London and New York. These agencies occupy about the same position as the brokers in tin held

until recently, the only difference being in the name, for they are in reality the brokers for the sale of tin or other East India produce, always under the direct control of the main establishment in the East. The cable and the comparative cheapness of distant messages through telegraph codes have created this change, which, together with the whole method of doing business at great distances now adopted, constitutes an entire revolution in trade that has been going on silently but irresistibly during the past five years.

These great changes would have produced more complicated results if speculation had been as active as it was previous to the panic, for the stock in European ports and the amounts afloat would then have been partially manipulated by both strong and weak operators; but as there has been no speculation since the panic, the market has been swayed by immediate and prospective demand almost wholly.

From this time forward we shall have to be prepared to witness a gradual strengthening of the speculative element. Money is and will, in all probability, remain easy for some time to come, and as tin has approached a point below which even the Australian producer will find mining unprofitable, speculators will soon, we presume, yield to the temptation of taking a hand in the tin market.

The following table shows the course of tin prices:

LOWEST AND HIGHEST PRICE (GOLD) OF STRAITS TIN AT NEW YORK SINCE DECEMBER, 1876.

	1877.	1878.
January.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
February.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
March.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
April.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
May.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
June.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
July.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
August.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
September.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
October.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
November.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2
December.....	16 1/2 to 17 1/2	14 1/2 to 15 1/2

This shows a decline of nearly 19 per cent. in the course of about a year and a half. The shipments from Singapore and Penang this way are unusually heavy just at present, and the tendency here has become a very weak one in consequence.

In England and Holland the deliveries have been satisfactory thus far the present year, being for the first six months 6061 tons of foreign tin alone at London, against 5058 tons during the corresponding period of 1877, and in Holland from company's and private hands 102,309 slabs Banca and Billiton, against 103,260 slabs. The arrivals, with the amounts still afloat, have been sufficient to leave tin in about as unfavorable a statistical position as it held there on July 1, 1877:

STOCK IN ENGLAND AND HOLLAND.

	July 1, '78.	July 1, '77.	July 1, '76.
Tons.	Tons.	Tons.	Tons.
London.....	9,475	8,998	7,020
Banca in Holland.....	1,790	1,794	2,614
Billiton in Hol'd.....	1,593	1,418	1,146
Austra'n in Hol'd.....	426	700
Total.....	13,283	12,908	10,780

Afloat.

	1878.	1877.	1876.
Tons.	Tons.	Tons.	Tons.
Straits.....	10	434	750
Australian.....	2,716	3,376	1,951
Banca.....	525	1,154	351
Billiton.....	1,400	930	800
Total.....	4,651	5,126	2,951

The visible supply July 1, 1878, was therefore 17,914 tons, against 18,034 in 1877 and 13,761 in 1876. The stock of tin at Banca on April 1, 1878, was 60,331 piculs. The production of Billiton in 1877 was 61,794 piculs, against 59,533 piculs in 1876 and 62,263 in 1875. Netherlands India, it is thus shown, produces as much as ever, and the government at its auctions meets the market unhesitatingly. From what precedes we can arrive at no conclusions favorable to holders of tin, prices of which may decline still further, unless, as we have indicated, speculation for an advance succeeds in raising its value, and an active demand from all quarters sustains it at the higher price then reached.

Some Statistics of Iron Making and Transportation in the South.

The shipments of pig iron through Chattanooga from furnaces south of that city, for the six months ending June 30, 1878, were as follows:

To	Tons.
Nashville, Tenn.....	600
Louisville, Ky.....	450
St. Louis, Mo.....	3,029
Cincinnati, Ohio.....	300
Evansville, Ind.....	250
Fort Wayne, Ind.....	150
Terre Haute, Ind.....	100
Jeffersonville, Ind.....	100
Indianapolis, Ind.....	30
Litchfield, Ill.....	30
Chicago, Ill.....	10
Points not enumerated above.....	550
Total.....	10,460

The shipments of pig iron from Chattanooga, "local," to the following points for the six months ending June 30, 1878, were as follows:

To	Tons.
Nashville, Tenn.....	450
Louisville, Ky.....	1,350
St. Louis, Mo.....	1,042
Cincinnati, Ohio.....	30
Terre Haute, Ind.....	140
Other points.....	313
Total.....	3,723

The following table shows the average cost per ton per mile freight on the above iron from Chattanooga to points of destination:

2003 tons cost.....	cost per ton per mile.
5700 ".....	76-1000. " "
4400 ".....	77-1000. " "
435 ".....	79-1000. " "
200 ".....	80-1000. " "
100 ".....	87-1000. " "
1003 ".....	88-1000. " "
50 ".....	73-1000. " "
40 ".....	88-1000. " "
50 ".....	89-1000. " "

There has been consumed by the different works in Chattanooga during the same time

4246 tons pig iron. During the six months there were shipped from stations on the Western and Atlantic Railroad to points South, 1665 tons pig iron.

There are some features of this showing which merit consideration. One of these is the large proportion of scrap and old rails used by manufacturers, as indicated by these statistics. The products of the mills and foundries of Chattanooga in the six months covered by our figures may be safely stated as 11,000 tons. Of this total the mills have produced in finished iron, bolts, spikes and nails, including railroad bars, fully 10,000 tons. It will be observed that but 4246 tons of pig have entered into this product. And of this amount of metal over three-fourths were worked into nails, bolts and spikes. It is not very long ago that old rails were regarded as fit only to be rerolled. Now they enter into the product, largely, of almost every kind and form of wrought iron.

It is clear enough that this can have but one effect on the market for all material worked up into finished iron, wrought or cast. The price of scrap must continue to advance until it will not pay to use so great a proportion of it as now. This will naturally advance the price of pig and induce an increase of production. It will, however, take some time to work down stocks of pig and make a very sensible impression on the market for that material. The tendency to use so great a proportion of scrap has depressed the price, particularly of mill irons, while the same cause has advanced scrap and old rails and rendered the supply less plentiful. Other causes are at work which will further advance the price of scrap and render it more scarce than now. Among them is the rapid substitution of steel for iron rails; the superior quality of both wrought iron and cast iron produced since 1874; especially the great improvement in the lasting capacity of bar irons and car wheels in the last few years, which has reduced the comparative consumption and the amount of worn-out materials of both kinds. Again, the substitution of steel for iron in agricultural and other machinery must reduce the supply of scrap iron. Considerable scrap is now used by steel makers, which is another cause of reduction of supply and increase of price.

Another point in our statistics which is worthy of special study is the low rate of transportation secured by Southern iron makers. We need not comment on the figures presented. Any business man can interpret them for himself. We may remark, in passing, that the rates will explain several features of the Southern iron trade which will suggest themselves to our Eastern and Northern readers who are familiar with the trade in general.

Immigration to Brazil has of late increased so much as to seriously embarrass the government, and orders have been issued by authority of the Emperor which are intended to discourage others from coming. Brazil is an overrated country. It has within it the possibilities of progress, but it has not yet made much headway, and cannot until its people realize the importance of changing their habits of life. The climate favors indolence, and the methods of agriculture are very crude. Many enterprises are open to men with capital, but labor and professional services are in small demand, and at present the country offers but few inducements to immigrants depending upon their labor. The native population is essentially lacking in enterprise, and many promising openings for manufacturing and trade are neglected because popular prejudice against innovations must first be overcome. In a word, Brazil is a country of prospective importance, but most of those who go there now find it a present disappointment.

The French are a nation who appreciate their opportunities. An official decree has just been issued at Paris authorizing a national subscription to assist certain classes of artisans to visit the Exposition for purposes of instruction. The intention will be further advanced by purchasing with the money subscribed articles from the Exhibition, which will be put in a lottery with 1,000,000 tickets of one franc each. We do not think much of the lottery scheme, but the idea of sending artisans to the Exhibition is eminently good and will greatly promote the industrial progress of the nation.

An Important Bankruptcy Decision.—Chief Justice Waite has just rendered a decision relative to bankruptcy compositions which is of interest and importance. A bankrupt firm were doing business in New York and California—one of the partners residing in New York, and the other in San Francisco. The debtors were forced into bankruptcy in the New York district and offered a composition of 20 per cent. in deferred payments, and in addition to allow the creditors to realize on the firm's real estate. A number of the creditors opposed the composition. Judge Blatchford overruled the objections and confirmed the composition. The creditors appealed. On appeal the Chief Justice holds that the offer was a proper one; that the District Court had properly acquired jurisdiction of the debtors; that the absence of the San Francisco partner from the composition meeting was properly excused by a majority of the creditors; that nothing short of fraud or gross error in judgment should call into exercise the jurisdiction of the Appellate Court in these composition cases. The most important part of the decision was this, that creditors who fail to prosecute their rights in these composition meetings cannot have relief from the court on appeal,

and that unexcused debtors need to attend the first meeting, but not the second, in composition cases.

Metallurgical Notes.

ROASTING AND SINTERING LEAD ORES AT PRZIBRAM.

The lead ores coming from the famous mines of Przibram, in Bohemia, are subjected to roasting and sintering in reverberatory furnaces which have seven working doors on each side. They have single hearths, but double arches, so that the gases must pass double the length of the furnace. This utilizes the heat well and promotes the settling of the dust carried along by the gases. The fire bridge is cooled by a current of water to protect it from corrosion. The following are the chief dimensions of the furnaces: Total outside length, 46 feet; total width, 12.5 feet; inside width, 8.25 feet; width of grate, 2.6 feet; total height, 7.6 feet. The object of the work in these furnaces is to roast the ore thoroughly and then to sinter it in such a manner that it is not reduced. The mixture of ore of different grades is generally such that it holds 50 per cent of lead. After sintering it must not contain more than 1 per cent. of sulphur. This is arrived at by keeping the thickness of the ore bed on the hearth at 1.6 to 2 inches, and by constantly rrabbling. The ore is, too, gradually moved from the cooler to the hotter part of the furnace, toward the fire bridge. Four tons of ore are roasted in this manner in 24 hours, one-third of a ton being withdrawn every two hours, while one ton is charged every six hours. Four workmen are required for every shift of 12 hours, one of them constantly firing, 1300 lbs. of middle quality coal being used in 12 hours. The sintered ore has almost the same weight as the raw material, but it has been noticed that the percentage of lead increases a little, while the amount of silver remains constant. This is shown by the following assays, which represent a year's average: Raw ore, 0.311 per cent. of silver and 49.92 per cent. of lead. Sintered ore, 0.311 per cent. of silver and 50.04 per cent. of lead.

THE COUILLET GAS PUDDLING FURNACE.

The Couillet gas puddling furnace was designed with a view to obtaining the advantages of gas firing without incurring the heavy expense connected with the construction of a Siemens, Ponsard, Bicheroux or Boetius furnace. The furnace differs mainly from an ordinary puddling or reheating furnace in the following points: The arch is double for a part of its length, and in the space thus formed there are a number of square bricks. By eight rows of slits this flue is connected with the main body of the furnace just above the fire bridge, so that the atmospheric air which is drawn into the wide space mentioned by the draft of the furnace becomes heated before it mixes with the gases passing over the bridge. The fuel itself is charged through a furnace on an inclined plate, upon which it partly distills, and from which it slides upon a slightly inclined grate. It will be seen, therefore, that all the alterations required in an ordinary puddling furnace is a slight modification of the grate and the construction of the heating flue for the air of combustion, which, as several determinations have proved, reaches 550 degrees. Competitive trials made at Couillet have given the following results: Waste in puddling for the ordinary furnace, 14 per cent.; for the new Couillet, 12 per cent.; consumption of fuel, 115 lbs. per 100 lbs. of iron made in the ordinary furnace, against 90 lbs. in the other, the working charges being 506 and 550 lbs. respectively. In a large double Champeis furnace charging 880 lbs., changed according to the Couillet system, the waste fell during 210 days working to 11.24 per cent., and the consumption of fuel to 77.6 lbs.

LARGE PRODUCTION OF A GERMAN STEEL WORKS.

A correspondent of *Engineering* gives the following figures as the production of the Dortmund Union Steel Works, at Dortmund, in Westphalia, in the month of May, 1878, with two converters (designed for 7½ tons), in fifty shifts of twelve hours:

English tons.	
Bessemer ingots, in 50 shifts and 782 heats (9.31 metric tons heat, or 9.35 tons English.)	7,254
Rails produced in 50 shifts of 12 hours in one mill.	4,893
Tires produced in 50 shifts of 12 hours in one mill.	382
Axles and forgings.	147
Fish-plates, merchant steel, &c. products in 50 shifts of 12 hours in one mill.	766

Total finished products in May..... 6,198

The heaviest day's work was 36 converter heats in 24 hours, the mean not quite 16 heats (15.6) per shift of 12 hours. The above 782 converter charges of the Dortmund Steel Works consisted of:

Tons.	
Gray Bessemer iron.	6,798
Scrap.	1,091
Spiegel.	482

Total metal charged in May last..... 8,371

Output of ingots, 7264 tons; 86.82 per cent. ingots and 13.18 per cent. loss.

Roman Roads in Palestine.—A recent traveler in Palestine was astonished by the number and preservation of roads built in the Roman era. They were laid out on all main routes and were constructed so perfectly that in many sections they endure to-day as well as if finished not long ago. The country of Palestine was one of the most difficult sort to carry a system of roadways over, and yet its obstacles were surmounted with the least possible expenditure of labor. Every route was curbed on each side by lines of stones projecting from one to two feet above the surface of the soil; between these boundaries the avenue was paved; streams were crossed by bridges, whose style remains preserved alone in those of Italy to the present hour—as, for example, those of Venice; valleys were traversed by viaducts; and the causeways carried the line up or down mountain sides, either by piers of masonry or in channels sufficiently wide, cut out of living rock. Often zig-zags and steps were resorted to in climbing steep ascents. Whenever the street passed over solid rock, the wear of chariot wheels in the course of time made ruts, which remain to-day as plain and deep as when the last car passed over.

Statistics of the Foreign Iron Trade in 1877.

BY JAMES M. SWANK.

[Abstract from annual report to the American Iron and Steel Association, published July 15, 1878.]

GREAT BRITAIN.

Pig Iron.—From Mr. Robert Hunt's Mineral Statistics of the United Kingdom of Great Britain and Ireland for the year 1876, we learn that there were mined in that year 16,841,583 gross tons of iron ore, and that there were imported in the same year 672,235 tons of iron ore, principally from Spanish and Mediterranean ports. Mr. Hunt also makes mention of 300,000 tons of "purple ores" obtained from imported pyrites. The total quantity of iron ore returned as smelted in Great Britain in 1876 was 17,513,818 tons, from which were produced 6,555,997 tons of pig iron. There were consumed in the manufacture of this pig iron 15,598,381 tons of coal and coke. The production of pig iron was distributed as follows: England, 4,664,153 tons; Wales, 788,844 tons; Scotland, 1,103,000 tons. The number of furnaces in blast in the whole kingdom in 1876 was 585½.

Mr. J. S. Jeans, the secretary of the British Iron Trade Association, in his annual report for the year 1877, estimates the production of pig iron in the United Kingdom in that year to have been a quarter of a million tons less than that of 1876, which would give 6,300,000 tons as the product of 1877.

The following table, compiled from statistics prepared principally by Mr. Hunt, shows the growth of the pig iron industry in Great Britain from 1740 to 1877. The number of furnaces in blast in 1740 is said by Mr. Hunt, upon the authority of the Edinburgh *Philosophical Magazine*, to have been 59. The production of that year was 17,000 gross tons. Now there are many furnaces both in Great Britain and in the United States that will singly make double the product of 1740.

Years.	Gross tons.	Years.	Gross tons.
1740.....	17,000	1856.....	3,586,377
1788.....	68,000	1857.....	3,559,477
1799.....	125,000	1858.....	3,459,064
1804.....	259,000	1859.....	3,712,924
1818.....	325,000	1860.....	3,826,752
1830.....	400,000	1861.....	3,712,390
1823.....	454,866	1862.....	3,943,459
1825.....	531,379	1863.....	4,310,040
1827.....	599,000	1864.....	4,767,901
1828.....	703,184	1865.....	4,810,254
1830.....	678,417	1866.....	4,523,897
1833.....	700,000	1867.....	4,761,023
1835.....	1,000,000	1868.....	4,976,226
1839.....	1,347,700	1869.....	5,445,757
1840.....	1,396,400	1870.....	5,663,515
1842.....	1,099,138	1871.....	6,627,179
1844.....	1,999,668	1872.....	6,741,929
1845.....	1,319,520	1873.....	6,566,451
1847.....	1,999,598	1874.....	5,991,428
1848.....	2,700,000	1875.....	6,365,466
1852.....	3,060,838	1876.....	6,555,997
1854.....	3,218,151	1877, estimated	6,300,000

The following table shows the number of furnaces in each of the iron-producing districts of the United Kingdom in 1877, with their condition at the close of the year. It will be seen that just one-half of the furnaces were out of blast at that time.

Districts.	Built.	In blast.
Cleveland.....	119	88
Northeast of England.....	45	19
Northwest of England.....	97	59
South Staffordshire.....	147	47
North Staffordshire.....	40	35
Shropshire.....	25	13
Yorkshire—West Riding.....	52	27
Derbyshire.....	38	28
Northampton.....	20	14
Lincolnshire.....	21	9
Gloucestershire, Wiltshire and Somersetshire.....	18	5
North Wales.....	11	2
South Wales and Monmouth.....	163	88
Scotland.....	135	88
Charcoal furnaces.....	5	4
Total.....	974	489

Comparative figures of the number and condition of the blast furnaces of Great Britain at the close of each of the years 1874, 1875 and 1876 are as follows: 1874,—built, 1010; in blast, 671; 1875,—built, 993; in blast, 582; 1876,—built, 998; in blast, 531. A steady decline in the number of furnaces in Great Britain is apparent, but the abandonment of old furnaces has been neutralized by the building of furnaces of larger capacity and of modern style. The reduction in the number of furnaces has mainly taken place in the districts of South Wales and South Staffordshire.

The production of pig iron in late years in two of the leading iron-producing districts of Great Britain, and the stocks of pig iron on hand at the close of these years, are given in gross tons in the following table:

Stocks.	1870.	1871.	1872.	1873.
Scotland.	1,205,000	1,150,000	1,099,000	993,000
Stock Dec. 31.	665,000	490,000	194,000	130,000
Scotland.	1874.	1875.	1876.	1877.
Annual prod.	806,000	1,050,000	1,103,000	982,000
Stock Dec. 31.	96,000	170,000	363,000	905,000
Cleveland.	1870.	1871.	1872.	1873.
Annual prod.	1,655,000	1,884,000	1,969,000	1,990,491
Stock Dec. 31.	117,345	66,331	41,638	80,328
Cleveland.	1874.	1875.	1876.	1877.
Annual prod.	2,001,233	2,047,761	2,075,565	2,144,831
Stock Dec. 31.	89,737	74,258	182,541	304,797

The following table shows the production of pig iron in gross tons in all of Great Britain from 1867 to 1877, with the stocks on hand at the close of each year in the two leading districts of Scotland and the North of England:

Years.	Production of Great Britain.	Stocks in Scotland and North of England.	Average Price of Scotch Pig Iron.
1867.....	4,751,023	444,345	32/ 6
1868.....	4,976,226	780,927	32/ 9
1869.....	5,445,757	735,607	33/ 4
1870.....	5,663,515	782,345	34/ 4
1871.....	6,627,179	558,331	35/ 0
1872.....	6,741,929	625,608	36/ 10
1873.....	6,566,451	900,328	37/ 3
1874.....	5,991,428	185,737	38/ 6
1875.....	6,365,466	244,258	39/ 6
1876.....	6,555,997	345,541	39/ 6
1877.....	6,300,000	809,797	34/ 4

An increase, as above indicated, of 250,000 tons of stocks of pig iron at the close of 1877, a decrease of 250,000 tons in the production of the year, and the accompanying decline in prices, to be hereafter fully noted, show very plainly that the year was not a prosperous one for this branch of the iron trade of Great Britain.

Iron Ore.—The statement has been made above that there were imported in 1876 into Great Britain 672,235 tons of iron ore, and that 300,000 tons of ore were obtained from imported pyrites. The quantity of iron ore imported in 1875 amounted to 458,693 tons, and of ore from pyrites to 280,000 tons.

Mr. Jeans calls attention to the fact, presented in the returns of the Board of Trade, that in 1877 the quantity of foreign ores used in Great Britain was 1,140,434 tons, valued at £1,239,904. These ores are principally used in the manufacture of Bessemer steel. The figures show that the importation of iron ore is steadily increasing in Great Britain, and that it costs 21/ a ton. The cost of ordinary English ore suitable for conversion into iron rails ranges from 4/ to 6/ a ton. Concerning the supply of native English ore suitable for conversion into Bessemer steel, the *Newcastle Chronicle* expresses the following opinions:

"Very few of the iron ore producing districts of Great Britain furnish raw materials that are adapted for the manufacture of steel. Only two districts, indeed, yield such ores in anything like great abundance. These districts are Northwest Lancashire and Cumberland, and that both are rather untaunted to much greater development would almost appear to be established by the fact that, notwithstanding the greatly augmented demand for steel, the former only yielded about 50,000 tons, and the latter only about 52,000 tons more in 1876 than in 1871. Mining in both districts is uncertain and precarious, the ore being found in veins or pockets, and not in regularly defined horizontal beds; so that it is impossible to say whether the reserve still unworked is great or small, nor has it yet been proved over what area the deposits of ore extend. There is, indeed, no other ore native to this country that can be called altogether suitable for the Bessemer process. The brown hematite and sphatose ores of Cornwall, the red hematite of Somersetshire, the silicious hematite of Wensleydale, and the argillaceous carbonates of other districts might be used more or less for the same purpose; but of all of these put together there would hardly be sufficient to keep going a single establishment like the Barrow Hematite Works, with its 17 blast furnaces and 18 converters, for a single month—certainly not for many months in succession. It is under these circumstances that our steel manufacturers are resorting, as many of them have already done, to foreign sources of supply. Assuming that good hematite ore will henceforth, as heretofore, be needed for the manufacture of steel, there is no need to speak of the possibilities of the future in respect of the utilization of such impure ore as the lias of Cleveland. Steel may yet be produced with commercial success from ores of inferior quality, but this highly desirable result remains to be attained."

Finished Iron Trade.—Complete statistics of the iron production of Great Britain are wanting, not only for 1877 but also for previous years. It has been found to be impossible to obtain complete returns from all rolling mills. Mr. Jeans, however, supplies much valuable information concerning this branch of the British iron trade, which we condense from his account as follows:

"It does not, however, need any elaborate parade of statistics to prove that the finished iron trade has been seriously prostrated during the past twelve months. Foreign competition and the decay of the rail trade have largely contributed to this result; but these causes have not been unaided in their operation. Of late years the productive resources of our mills and forges have been augmented to an extent that probably very few are aware of. It may surprise those who are chiefly concerned to learn that, between 1860 and 1875, the number of finished iron works in the United Kingdom was increased from 208 to 314; the number of puddling furnaces from 3462 to 7575; and the number of rolling mills from 432 to 909. This represents, in round figures, a power of production augmented within 15 years to the extent of at least 2,467,800 tons. The total producing power of the 7575 puddling furnaces in the United Kingdom at the end of 1875 would be fully 4,542,000 tons a year, as compared with only 2,077,000 tons at the end of 1860.

"When it is recollected that within the same period our exports of finished iron advanced only from about a million tons to rather over 1,400,000 tons, with considerable upward variations in the altogether exceptional years 1872 and 1873, the calamitous state of matters that has supervened may be more easily explicable.

"We have no direct evidence of the total number of puddling furnaces now lying idle in the country. It is, however, certain that nearly two-thirds of the 920 puddling furnaces in South Wales are entirely inoperative, and recent statistics show that about 1000 furnaces in the North of England are unemployed; while in Staffordshire, Lancashire, Shropshire and Scotland there will be at least a thousand more. Of the 106 new finished iron works established between 1860 and 1877, many have now been closed for two or three years, and others have been entirely dismantled. In the North of England alone it is calculated that fully a million and a half invested in finished iron works has yielded no return for upward of two years.

"Letting alone the iron rail trade, it is not too much to say that the position and prospects of the finished iron trade otherwise are better than has recently been represented. This is proved by the fact that in the North of England the production of ship plates in 1877 was nearly 40,000 tons in excess of the production of any previous year, while angles rose about 10,000 tons above the quantity produced in any former 12 months.

"But while these facts are not without encouragement, it must be admitted that the state of the iron rail trade is simply deplorable. Although statistics of the trade in South Wales are not easily accessible, we have ascertained that the yield of iron rails last year in the principality was rather under 100,000 tons, as compared with a yield of 534,000 tons eight years ago. Here, then, we find, in round figures, a decline of nearly 450,000 tons per annum. In the North of England the state of affairs has been relatively worse than that of South Wales. The total make of rails in the so-called Cleveland district in 1873 was not less than 324,420 tons. Last year it was only 36,750 tons. The decrease therefore was close on 300,000 tons. This reduced production of over 700,000 tons per annum

represents the discontinuance of about 1300 puddling furnaces, and the labor of nearly 13,000 puddlers and millmen. Taking the value of the rails at the normal rate of 1871, it will represent also a reduction of £5,250,000 in the annual turn-over of our rail manufacturers. These are large and probably somewhat startling figures.

"So far as Scotland is concerned, we have ascertained that the total quantity of malleable iron produced during 1877 was 218,000 tons, being 12,000 tons less than the production of 1876."

Mr. Jeans presents some tables which show the production of finished iron in 1877 to have approximated 1,704,000 gross tons, while the capacity of the rolling mills of the country was equal to the production of at least 4,295,000 tons.

Bessemer Steel.—A statement is made by Mr. Jeans of the number of Bessemer works in Great Britain from 1868 to 1877, which we copy below.

"Since 1868 the productive resources of the Bessemer works in this country have exactly doubled. In that year the 18 works erected had a capacity of only 57 converters. Last year there were 25 works, with not less than 114 converters. The development of the trade will be easily followed by a perusal of the annexed table, which gives the number of Bessemer steel works and converters in the United Kingdom from 1868 to 1877, both inclusive.

Year.	No. of Works.	No. of Convert'rs.
1868.....	18	57
1869.....	18	59
1870.....	19	71
1871.....	19	89
1872.....	19	91
1873.....	21	106
1874.....	21	106
1875.....	22	109
1876.....	24	110
1877.....	25	114

"The converters are of various capacities, ranging from three to ten tons. No less than 24 are of the capacity of three tons and under. Twenty-five are of the capacity of five tons. Thirty-nine are of six tons capacity, and the remainder are seven tons and upward. At one establishment only—that of John Brown & Co., Sheffield—are there converters of ten tons' capacity."

The production of Bessemer steel ingots in Great Britain from 1870 to 1877 is given by Mr. Jeans as follows: 1870, 215,000 gross tons; 1871, 329,000 tons; 1872, 410,000 tons; 1873, 496,000 tons; 1874, 540,000 tons; 1875, 620,000 tons; 1876, 700,000 tons; 1877, 750,000 tons. A fact in connection with these statistics which will arrest attention is the small yield of so many converters. In the United States there were produced in 1877, with 22 converters, each of five tons' capacity, 560,587 net tons of Bessemer steel ingots, or almost exactly 500,000 gross tons; yet Great Britain in the same year produced with 114 converters only one-half more tons of ingots than were produced in this country.

The growth of the Bessemer steel industry in Great Britain since 1868 has been quite rapid, if the increase in converters and in the production of ingots be considered. This growth does not appear to have been arrested by any influences whatever, but has rather been accelerated by recent events. Owing to the decline in the prosperity of the finished iron trade and the increasing popularity of Bessemer steel, there has been developed a disposition to convert iron rolling mills into Bessemer steel works. Messrs. Bolckow, Vaughan & Co. are now making this change at Middlesborough. At Exton this firm established Bessemer works last year, which are now in operation, producing about 1200 tons of steel rails per week, four eight-ton converters being employed. The works are being rapidly extended, and the firm ultimately intends to make steel plates as well as rails. The decision of this strong firm to still further increase its facilities for the manufacture of Bessemer steel, by converting its iron rolling mills at Middlesborough into Bessemer works, shows how hopeless it is of a revival in the iron rail trade, notwithstanding the efforts of Mr. I. Lowthian Bell and others to utilize the ore of the North of England in the production of a superior quality of iron rails. There is, of course, a possibility that the manufacture of Bessemer steel may be overdone in Great Britain, but it is significant that this manufacture would not recently have been extended but for the assumed certainty that the iron rail trade of England and Wales is dying.

Crucible and Open-Hearth Steel.—Mr. Jeans states that on the 1st of January, 1878, there were in Great Britain 15 works producing steel by the Siemens and Siemens-Martin processes, employing 90 furnaces, with an annual capacity of 250,000 tons. About 500 crucibles, with an annual capacity of 20,000 tons, are also worked in connection with the Siemens regenerative gas furnace. Annexed is a summary in gross tons from statistics supplied to Mr. Jeans by Dr. C. W. Siemens of the production of open-hearth steel in Great Britain during the past five years, and of crucible steel in the same period with the Siemens regenerative gas furnace.

Year.	Open-hearth Steel.	Crucible Steel.
1873.....	77,500	5,900
1874.....	90,500	3,300
1875.....	88,000	4,000
1876.....	128,000	4,100
1877.....	137,000	3,900
Totals.....	531,000	21,200

It has been estimated by an apparently careful English writer that the production in Great Britain in 1877 of all steel other than Bessemer steel was about 250,000 gross tons. Deducting from this amount the 140,000 tons

AMERICAN SCREW CO.,

Providence, R. I.,

**MANUFACTURERS OF MORE THAN 4000 VARIETIES OF PRODUCT,
AND INCREASING THE ASSORTMENT DAILY.**

Machinery employed contains important inventions recently patented, and which are designed to produce Screws at a **lower cost to the consumer** than has ever been attained.

All goods are distributed through the Hardware trade, to whom a liberal discount will be allowed.

INTERNATIONAL EXHIBITION. PHILADELPHIA, 1876.

(No. 235.)

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

PHILADELPHIA, November 8, 1876.

REPORT ON AWARDS.

Product: Iron, Brass and Steel Screws, Tire and Stove Bolts, Rivets.

Name and address of Exhibitor: American Screw Company, Providence, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz: **Being of a quality nearly approaching perfection, showing the highest attainment in this branch of manufacture.**

G. L. REED, Signature of the Judge.

Approval of Group Judges.

Daniel Steinmetz,
Jas. Bain,
Chas. Staples,

G. L. Reed,
J. D. Imboden,

J. Dissenbach,
Dav. McHardy.

A true copy of the record. FRANCIS A. WALKER, Chief of the Bureau of Awards.
Given by authority of the United States Centennial Commission.

[L.S.] J. L. CAMPBELL, Secretary.

A. T. GOSHORN, Director-General.
J. R. HAWLEY, President.



After forty years' experience we offer to the trade our Centennial Screws, patented May 30, 1876, as the best we have ever known.

The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at the same price as the old style screw.

The new screws will be packed in manila colored boxes with the new label covering end of box, and enlarged figures showing plainly contents.

To distinguish this screw we have adopted a trade-mark, which is also secured to us.

The accompanying engravings show the progress of making screw from the old blunt point to style now adopted.

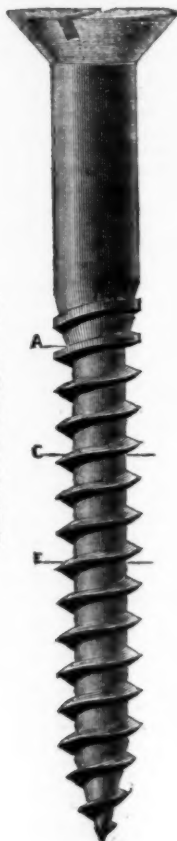
Experience has shown that the weak point of screws, as formerly made, is at the heel of the thread, where all

1776.



1846.

Patented August 30.



Section at Line A

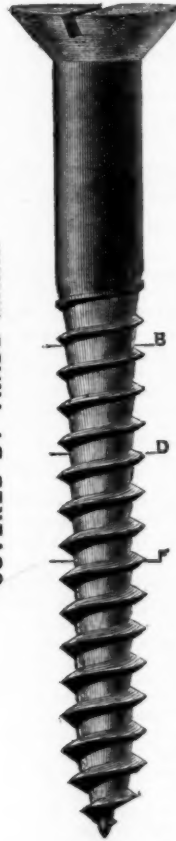
Section at Line C D

Section at Line E F

1876.

Patented May 30.

COVERED BY TRADE MARK.



Section at Line A B

Section at Line C D

Section at Line E F

Estimated to be FIFTY PER CENT. stronger than a Screw as Commonly made.

the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated. See sections at lines.

CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

On the opposite page will be found illustrations of the various Works of the company.

SPECIAL ANNOUNCEMENT TO THE HARDWARE TRADE.

THE

AMERICAN SCREW CO.

WILL MAKE A

PEREMPTORY SALE

OF

HALF A MILLION GROSS

Of their Best Quality

Patent Gimlet Pointed Flat Head Iron Wood Screws,

THROUGH

Messrs. BISSELL & WELLES, Auctioneers,

AT THEIR SALESROOM,

83 Chambers and 65 Reade Streets, - NEW YORK,

On Wednesday, August 21, at 10 o'clock a. m.

The goods will be offered in lots to suit all classes of buyers, but assortments sold will be required to be in the usual proportion of sizes, unless otherwise agreed.

Parties unable to attend can make up their orders and forward to the auctioneers or their own correspondents to purchase for them.

All goods will be delivered F. O. B. at Providence, and through Bills of Lading obtained when desired. Terms, cash in 30 days from date of sale for approved credit.

To parties who take less than a full case of a size, an extra charge of $2\frac{1}{2}$ per cent. will be made on the amount repacked.

[Continued from page 15.]

Statistics of the Foreign Iron Trade in 1877.

"One very important feature in the ship-building annals of the past year relates to the advances made toward the more general employment of steel. Lloyds have determined, after a minute inquiry, pursued at all the principal steelmaking works in the kingdom, to allow a general reduction of 20 per cent. in the thickness of the plating, frames, &c., of ships built of steel. Concessions in favor of steel have likewise been allowed by the admiralty, who have contracted for the building of several vessels of this material. Colonel Gordon has contracted with Messrs. Yarrow & Co., ship-builders on the Thames, for the construction of four very light draft steel steamers; and merchant vessels of the same metal are being built by Messrs. C. Mitchell & Co., on the Tyne, Messrs. R. Dixon & Co., on the Tees, and other firms."

The building of iron sailing vessels in British shipyards seems to be declining. In 1874 there were built on the Clyde 53 such vessels, with a tonnage of 68,500 tons; in 1875, 50 vessels, with a tonnage of 102,136 tons; in 1876, 47 vessels, with a tonnage of 96,880 tons; in 1877, 57 vessels, with a tonnage of 75,200 tons.

At the beginning of the present year there were building on the Clyde 127 iron vessels of about 133,551 tons, against 146 vessels of about 152,745 tons at the beginning of 1877, and 144 vessels of about 132,280 tons at the beginning of 1876.

Coal.—The production of mineral coal in Great Britain from 1854 to 1877 is given as follows by Mr. Robert Hunt, Keeper of Mining Records, except for 1877, which is taken from the report of the Inspectors of Mines for that year, and is probably too high.

Year.	Gross tons.	Year.	Gross tons.
1854.....	64,661,407	1866.....	101,630,544
1855.....	61,453,079	1867.....	104,500,480
1856.....	66,645,450	1868.....	103,141,157
1857.....	65,394,707	1869.....	107,497,557
1858.....	65,028,649	1870.....	110,431,152
1859.....	72,976,765	1871.....	117,352,028
1860.....	80,043,698	1872.....	123,497,316
1861.....	83,635,214	1873.....	127,016,747
1862.....	81,638,338	1874.....	125,043,257
1863.....	86,929,215	1875.....	131,867,105
1864.....	98,787,873	1876.....	133,344,766
1865.....	98,150,587	1877.....	134,179,968

During 1877 there were exported to other countries 15,358,828 tons of coal and coke, against 16,299,077 tons in 1876, 14,544,916 tons in 1875 and 13,927,205 tons in 1874. The decrease in 1877, as compared with 1876, was 940,249 tons. The average price of the coal and coke shipped in 1877 was a little over 10s. a ton. Since 1860 the exports of British coal and coke have been doubled. In that year they amounted to 7,412,000 tons. The production of coal in 1876 was doubled in 1876.

The following table shows in detail the course of the British coal export trade during the past three years:

Countries.	Quantities.		
	1875.	1876.	1877.
To Russia.....	895,860	1,187,000	1,044,374
Sweden & Norway.....	1,135,109	1,148,617	1,195,980
Denmark.....	749,399	779,829	765,818
Germany.....	2,174,384	2,178,905	2,099,938
Holland.....	455,964	480,821	411,655
France.....	3,726,210	3,450,564	3,282,372
Spain and Canaries.....	693,196	760,560	823,871
Italy.....	1,006,453	1,213,614	1,065,585
Turkey.....	243,466	290,455	214,216
Egypt.....	334,422	545,337	522,170
Brazil.....	384,057	398,159	340,083
Malta.....	238,072	302,871	278,339
British India.....	615,345	759,855	896,174
Other countries.....	2,745,909	2,972,005	2,788,953
Total.....	14,544,916	16,299,077	15,358,828

Countries.	Value.		
	1875.	1876.	1877.
To Russia.....	\$264,994	\$268,537	\$264,288
Sweden & Norway.....	749,354	639,937	622,256
Denmark.....	457,330	407,353	378,670
Germany.....	1,272,624	1,122,666	953,772
Holland.....	304,295	273,863	213,715
France.....	1,017,038	1,064,711	1,344,056
Spain and Canaries.....	338,800	460,841	479,468
Italy.....	647,956	638,235	515,060
Turkey.....	178,482	162,413	113,670
Egypt.....	402,800	323,859	282,710
Brazil.....	293,317	217,247	206,025
Malta.....	172,679	180,028	153,880
British India.....	458,858	456,763	494,350
Other countries.....	1,945,416	1,718,042	1,507,620
Total.....	\$9,658,088	\$8,904,463	\$7,828,497

British Iron and Steel Exports and Imports in 1877.—The following table shows the quantities of iron and steel and manufactures thereof which have been exported from Great Britain to all countries from 1871 to 1877:

To.	From.	Quantities in Tons.						
		1871.	1872.	1873.	1874.	1875.	1876.	1877.
Total iron and steel.....		3,169,419	3,178,766	3,057,813	3,458,306	3,444,790	3,444,693	
Iron, solid.....		1,957,438	1,931,143	1,842,065	2,161,216	2,167,827	2,167,827	
Steel, solid.....		1,211,981	1,247,623	1,215,748	1,297,090	1,286,979	1,286,979	
Cast iron, in manufactures.....		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
Steel, in manufactures.....		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
Cast iron, in manufactures.....		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
Steel, in manufactures.....		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
Cast iron, in manufactures.....		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	
Steel, in manufactures.....		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	

The values of the exports to all countries in the years named in the above table are as follows:

1871, £26,124,134; 1872, £35,996,167; 1873, £37,731,239; 1874, £31,190,256; 1875, £25,747,271; 1876, £20,737,410; 1877, £20,094,562. A steady decline in quantities has occurred since 1872, with the exception of a slight increase in 1877. A large decline in values has yearly taken place since 1873.

The following table shows the total quantities of iron and steel exported from Great Britain to all countries in 1875, 1876 and 1877, the names of the principal consuming countries being given:

Countries.	1875.	1876.	1877.
Germany.....	299,498	298,416	285,100
Holland.....	278,909	267,821	282,025
United States.....	206,114	158,824	167,764
Australia.....	190,436	122,073	215,905
British N. America.....	172,079	131,990	119,504
Russia.....	170,700	138,538	101,012
British India.....	138,335	158,093	230,421
Belgium.....	109,531	175,418	98,948
France.....	104,785	112,319	122,886
Sweden & Norway.....	53,003	41,258	60,481
Italy.....	48,359	53,074	43,745
Brazil.....	33,593	33,803	59,164
Spain.....	29,379	31,860	33,937
Peru.....	16,218	3,076	2,720
Chile.....	14,218	3,076	2,720
Turkey.....	12,357	9,993	7,405
British South Africa.....	7,908	8,400	10,726
Denmark.....	7,050	6,201	3,638
Egypt.....	7,049	582	1,003
Other countries.....	390,335	533,575	558,521
Total.....	2,458,206	2,224,470	2,344,651

The principal exports to Germany are pig iron, rails, hoop, sheet and plate iron and castings; to Holland (principally in transitu for Germany), pig iron, hoop, sheet and plate iron and castings; to United States, pig iron, tin plate and steel; to Russia, Australia and British India, bar iron, rails, hoop, sheet and plate iron and castings; to British North America, pig iron, bar iron, rails, hoop, sheet and plate iron and castings; to Belgium, pig iron; to France, pig iron; to Sweden, Norway and Denmark, rails; to Italy, bar iron, rails and hoop, sheet and plate iron; to Brazil, rails and castings; to Peru, Chile, Spain and Egypt, rails; to Turkey, bar iron; to British South Africa, castings; to other countries, pig iron, bar iron, hoop, sheet and plate iron and castings.

The annexed table shows the exports of rails of iron and steel and rail fastenings during the ten years from 1868 to 1877:

Year.	Tons.	Value.
1868.....	28,488	\$4,666,612
1869.....	28,010	\$3,725,770
1870.....	1,059,399	\$7,575,552
1871.....	981,197	\$8,084,619
1872.....	948,490	\$10,225,492
1873.....	798,014	\$10,418,858
1874.....	780,437	\$9,629,858
1875.....	545,981	\$4,453,836
1876.....	444,656	\$3,700,105
1877.....	497,924	\$3,864,916

The British Board of Trade has recently undertaken to separate the exports of iron rails from those of steel. The figures for 1876 and 1877 are as follows: Iron rails exported in 1876, 190,054 tons; in 1877, 176,222 tons; steel rails exported in 1876, 173,481 tons; in 1877, 234,481 tons.

The importation of foreign iron into Great Britain is increasing annually. It is iron that is chiefly used for house building purposes, and is supplied principally by Belgium. In 1877 the value of foreign iron and steel imported into Great Britain reached £1,943,622.

Prices.—During 1877 the prices of British iron and steel declined steadily. Cleveland pig iron fell from 45s. to 40s. for No. 3, and from 45s. to 38s. for No. 4. The price of Scotch pig iron, good mixed brands, declined from 57s. in January to 51s. 6d. at the close of the year. The following table, prepared by Messrs. W. Fallows & Co. of Liverpool shows the lowest price of several classes of iron which have prevailed in Great Britain at various periods between 1851 and 1877, the exceptionally high prices of 1873 being included:

Years.	Welsh bar in Liver.				Rails in Wales.			
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1851.....	4 17 6	5 7 6	7 0 0	4 15 0	5 0 0	5 0 0	5 0 0	5 0 0
1852.....	5 10 0	5 10 0	7 0 0	5 10 0	5 10 0	5 10 0	5 10 0	5 10 0
1853.....	5 15 0	6 30 0	6 30 0	5 10 0	5 10 0	5 10 0	5 10 0	5 10 0
1854.....	11 10 0	13 0 0	13 0 0	12 0 0	12 0 0	12 0 0	12 0 0	12 0 0
1855.....	6 12 6	7 10 0	7 10 0	5 0 0	5 0 0	5 0 0	5 0 0	5 0 0
1856.....	6 0 0	6 0 0	6 0 0	5 0 0	5 0 0	5 0 0	5 0 0	5 0 0

Mr. Walter R. Wood of Dennis, near Stourbridge, has recently published a series of charts showing the fluctuations in the quoted prices of Staffordshire pig and bar iron for a long series of years. It appears that Staffordshire bars during the last 40 years have never been so low as they were in the third quarter of 1843, when they stood at £5 per ton, and were never so high as from the middle of the third quarter of 1873, when £16 per ton was paid. From 1858 to 1870 the prices fluctuated comparatively little, and previous to 1873 marked bars were never higher than £12 per ton, and then only for one quarter of 1845. Quotations of Staffordshire pig iron never reached so high a figure as they did in September, 1872, when £6. 10s. was the rate. The nearest approach was from April to July, 1845, when they touched £6. Again, prices have only twice been as low as they were at the end of 1877 and at present—£2. 5s. From July to October, 1843, and in April, 1852, the price was the same as now prevailing. From 1855 to the last quarter of 1863 prices did not fluctuate much; and again, from the middle of 1864 to the beginning of 1872 there was scarcely any change.

Mr. Jeans compiles from "official sources" the following table of the prices of Bessemer steel rails at the works in Great Britain during each half year from 1870 to 1877.

January to June.	July to Dec.	1870.		1871.		1872.		1873.		1874.		1875.		1876.		1877.	
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
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Since the close of 1877 the prices of Bessemer rails in England have still further declined. In April last contracts were made at £5. 15s., and during the first week in June prices at Middlesbrough and in South Wales were quoted as low as £5. 7s. 6d. and £5. 5s. 6d.

General Summary.—The trade circulars,

the newspapers, and Mr. Jeans' report concur in characterizing the course of the British iron trade in 1877 as being steadily downward and wholly discouraging. The steel trade, however, with the exception of low prices, was not so greatly depressed as that of iron. Prices of iron and steel uniformly receded throughout the year; exports were a million tons less than in 1872 and £16,000,000 less in value; the production of finished iron, including iron rails, largely declined; less pig iron was made than in 1876, and stocks of pig iron were larger at the close of the year than for many previous years, aggregating probably a million tons; half of the furnaces in the kingdom were out of blast at the close of the year; and imports of iron from Belgium continued to increase. The coal trade was also greatly depressed throughout the year, the exports being almost a million tons less than in 1876 and £1,076,000 less in value. With scarcely an exception, all the leading industries of Great Britain were greatly depressed throughout 1877, an unfavorable condition which continued during the first half of 1878.

All the advices we have received since the close of 1877 represent the prostration of British industries to have been greater than far in 1878 than in 1877. For example, at the end of May, of 165 furnaces in the North of England, 70 were out of blast, against 47 out of blast at the corresponding period of 1877. Stocks were still large, in excess of 276,000 tons. Ship plates had fallen to £6. 2s. 6d. less commissions, and all branches of the finished iron trade were languishing. At the end of May there were 89 furnaces in blast in Scotland against 114 at the same time last year. As compared with December, 1877, stocks had increased about 50,000 tons. The total value of British exports during the month of May was £16,165,075, against £17,461,139 in May, 1877, and £17,055,504 in May, 1876. The value of the iron and steel exported in May last was £1,733,434, against £2,136,566 in the same month of 1877, and £2,082,931 in May, 1876; the quantity exported was 220,619 tons, against 251,114 tons in May, 1877, and 233,056 tons in the same month of 1876. The great strike in the Lancashire cotton district, with its riotous excesses, is so fresh in the minds of our readers that we need only to refer to it.

As a matter of course, the depression in British industries has most affected the workmen and their families. British journals have frankly admitted the widespread distress which has been created in British workmen's homes by the slackened demand for labor and the enforced reduction in wages. From a mass of sickening details of destitution and suffering in the manufacturing districts of Great Britain at the close of 1877, we take from the London Times of December 30, 1877, now lying before us, the following picture of the distress in Wales:

"The distress in Wales, which has been for some time, week by week, making itself more apparent in the populous districts, is spreading now with a rapidity which will soon make it cover a large area of ground and involve a far larger proportion of inhabitants than at the time of the strike and lock-out of the colliers and ironworkers in 1875. For the last ten years the iron and coal trades have never been so depressed as at the present time, and the demand for coal is only forced by the extreme low price at which it is sold. In no part of the country has the falling off been so great as in the South Wales ports. At the Cardiff docks there are now miles of laden coal wagons waiting for shipment. Since April the shipments of coal have fallen off from 363,000 tons a month to foreign parts to 215,000 last month. At Swansea the shipments have been falling off at the rate of 10,000 tons a month, and at Newport 20,000 tons a month. Coincidentally with this, the price of coal has fallen off at Cardiff, owing to the large increase in the number of able-bodied men applying for relief, the guardians have been compelled, in consequence of the workhouse being crowded, to open a stoneyard for the employment of married men, and the applications for admission are increasing at the rate of about fifty a week. In November the out-door relief amounted to £260; it has now reached £292 a week, and the relieving officers affirm that there are many cases of extreme poverty in the town. Last week a family, consisting of seven persons, was found to have subsisted for days on a pauper's brewer's grains, which were intended for some pigs. At Penarth the vicar has called a public meeting in order to appeal for aid. At Penarth dock the coal tips are frequently idle for days. At Pontypridd, a great deal of distress prevails, and the guardians are giving large sums in out-door relief. Along the whole of the Rhondda Valley, whence there is the large output of coal in South Wales, collieries are only kept at work as little as possible, as the masters assert that every ton of coal sold by them at present prices involves a loss of from 6d. to 9d. per ton. At Merthyr the vicar hopes to open within a few days the drill-hall, where the children will receive one meal a day. During 1875 he fed in this way 5000 children daily, and there are many hundreds more now in a state of semi-starvation, who crowd along the streets every morning, turning over the dust-bins and refuse to pick up anything of the nature of food. So deeply is the distress felt outside the workhouse that the guardians of the Crickhowel Union have resolved not to give the inmates of the workhouse their usual Christmas dinner, as many thousands of tradesmen and mechanics who pay the rates are unable to provide a Christmas dinner for themselves. Mr. Buchan, the poor law inspector for the district, is now on a visit to South Wales, to advise the guardians on the best mode of meeting the demand for workhouse accommodation and out-door relief, and he has advised the erection at once of temporary iron sheds in all cases where the workhouses are filled. In the western parts of the county of Glamorganshire the distress is not so great."

Referring to the British iron trade in 1877, Capital and Labor, the well-known London journal, remarked at the close of the year that "its condition can be compared to what it was 35 years ago, when colliers and ironworkers were employed on the South Staffordshire roads for a shilling and a loaf a day."

(To be Continued.)

Fire-Proof Doors.

Among other matters treated of in the very practical series of circulars lately issued by President Atkinson, of the Boston Manufacturers' Mutual Fire Insurance Company, is one touching the relative value of tin-coated fire doors and those built entirely of iron. The circular is one of the greatest interest to our readers, and of importance to all who have anything to do with guarding large buildings from fire.

Boston, April, 1878.—Recent inspections of the premises insured by this company indicate that in many places reliance is still placed on iron doors as a means of preventing the spread of fires, and some doubts are still occasionally expressed as to the efficacy of wooden doors covered with tin. The following testimony is submitted for the information of those who are seeking the most complete safeguards against loss by fire: "Boston, April 9, 1878.—The undersigned has usually visited the scene of all fires reported to this office, in which we are interested as underwriters, whether the damage were much or little; and one principal object of the visit was to study the fire as to cause, progress and results, and I may say that I have never yet seen a well made wooden tin-coated door which gave to the fire; and I have no recollection of any case in which an iron door of ordinary construction, subjected to a heavy fire, has proved reliable. Among the many pickers fires which have happened in mills insured by this company since 1862, only one has proved destructive to the mill, and the door in this case, dividing the picking room from the mill, was of iron, and did not hold the fire at all, but immediately softened and warped out of shape, allowing the fire free passage to the mill."

"Wm. B. Whiting, Sec'y." "BOSTON, MASS., April 8, 1878.—Upon examination of the burned portion of the Pacific Mills, in company with Mr. Rideout, the overseer of the watch, I learned the following respecting the efficiency of iron and tin-coated wood doors in resisting the late fire: "I. At the west end of the steaming room, where the fire originated, is an 18-inch brick fire-wall, in which are double doors made of 2-inch plank and tin-coated on both sides—put in, as I am informed, at the instance of Mr. Whiting, within five years. The flames were in direct contact with

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JAMES OSTRANDER & SON,
ESTABLISHED 1845.
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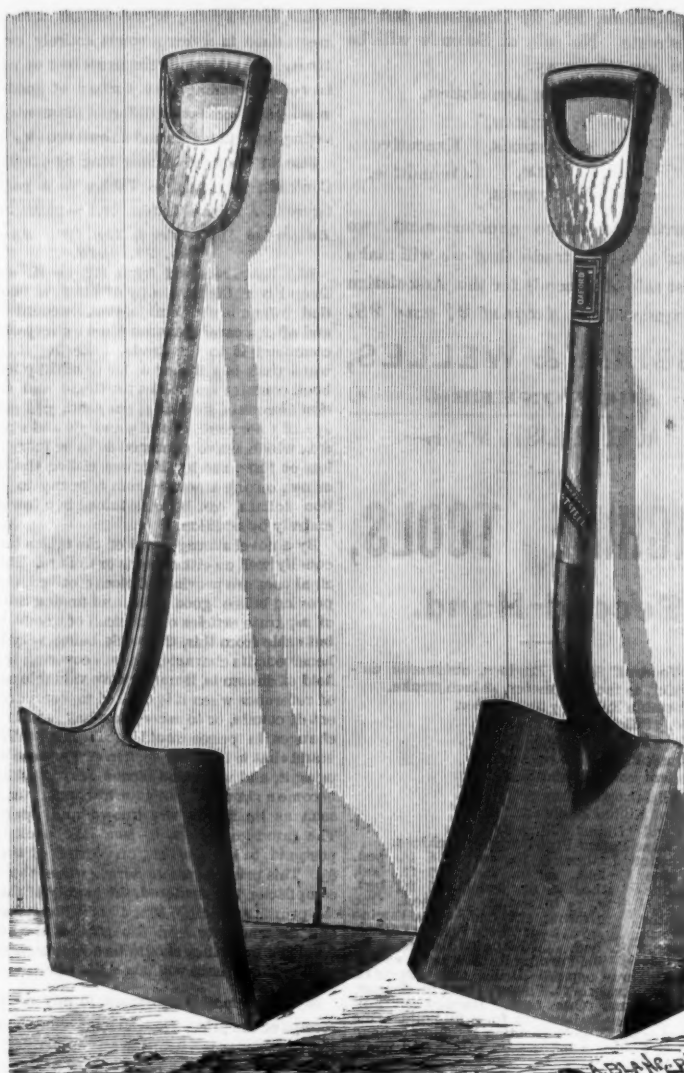
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AND
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Scientific and Technical Notes.

In order to exhibit the dynamic force of the voice, Prof. Edison has constructed a PHONOMETER.

The machine has a diaphragm and mouth-piece similar to a phonograph. A spring which is secured to the bed-piece rests on a piece of rubber tubing placed against the diaphragm. This spring carries a pawl that acts on a ratchet or roughened wheel on the fly-wheel shaft. A sound made in the mouth-piece creates vibrations in the diaphragm which are sufficient to propel the fly-wheel with considerable velocity. It requires a surprising amount of pressure on the fly-wheel shaft to stop the machine while a continuous sound is made in the mouth-piece.

Dr. Hirzel of Leipzig has recently patented in Germany

GAS AND WATER-TIGHT CLOTH, which he makes by placing a large, smooth piece of so-called gutta-percha paper between two pieces of some not too coarse and dense material—e. g., shirting (undressed)—and then passing the arrangement between heated rollers. The outer pieces of shirting combine in the most intimate way with the inclosed gutta-percha to form a material which is impenetrable by gas and water. It may be made still denser and more resistant by being coated on both sides with, e. g., copal lac. The substance is conveniently flexible, and will remain proof against variable influences of weather and external temperature. It can be applied to all those purposes for which water-proof material is used, and it is well adapted to form gas-tight membranes for regulators of pressure of compressed gas, bags or sacks for dry gas meters, as also dry gas reservoirs.

The *Praktische Maschinen Constructeur* describes a simple

POCKET LEVEL, patented in Germany by Baumeister Bohne, of Charlottenberg. It consists of a cylindrical box two inches high and an inch and a half in diameter, with openings for two plane glasses. The axis of the level is immediately brought into a horizontal position by a weight suspended from the lower part of the inner portions of the instrument, which hang in a universal joint (Cardano's swing). It has a small Galileo telescope, which shows the object looked at and at the same time gives the magnified picture of a micrometer scale. To effect this the concave ocular is combined of a finely pierced biconcave and a plane-convex lens. The small central portion of the latter acts as a magnifying glass, while the rest acts in the ordinary manner. The weight may be arrested by a rod running through the handle. An invention made by Neuerberg & Co. of Vienna, for

COATING METALS WITH TIN, promises to extend its use for culinary and other uses. They propose its electro-deposition by means of a zinc and carbon battery. The inner cell containing the carbon is half filled with chromic acid, and the outer cell containing the zinc is filled with dilute sulphuric acid. The articles to be coated with tin are put into a bath composed of 8 parts of protochloride of tin, 16 parts of cream of tartar, and two parts of the chloride if the latter is used. When it is present the tin coating is effected more rapidly, whereas, when the bath is composed of protochloride of tin and cream of tartar only, the tin coating is very white, but is not produced so rapidly as when the chloride is used. These ingredients should be dissolved in about 100 gallons of distilled water. The black plates are first "pickled" in any suitable manner, and then immersed in the above-described bath or solution, and are allowed to remain in the same for a longer or shorter time, according to the thickness of the deposit or coating of tin required on the plates. While in this bath the plates or other pieces to be coated are connected by a wire with the positive end of the battery, while the negative end of the battery is connected with a piece of tin hung in the same bath. When the plates or other pieces or articles have been sufficiently coated with tin, they are held over a fire in order to give the tin a lustrous appearance.

A Russian physicist, M. Wild, sums up his researches on the

MAGNETIC PROPERTIES OF NICKEL as follows: Pure nickel can become permanently magnetic to a considerable degree, thus differing notably from pure (soft) iron. The maximum quantity of magnetism which pure nickel can retain, however, is only about one-half or one-third of that which hard steel can retain. The magnetism of nickel is less permanent than in steel after the magnetizing force has ceased to act; the gradual loss of magnetic force being greater with nickel than with steel. The temporary magnetism which pure nickel can retain is about double its permanent quantity, or about one-half of the temporary magnetism which hard steel and about one-fourth of that which soft iron can retain. These results verify, therefore, the general belief prevalent among physicists that in its magnetic properties nickel is notably inferior to both iron and steel.

At the Paris Exhibition plates made by **MICHAUD'S PHOTO-ENGRAVING PROCESS** are attracting much attention. The following details on the method used is given in the *English Mechanic*: A negative of the subject to be reproduced having been obtained, a print is taken on a film of bichromated gelatine supported by a metal plate. The print is developed by the usual means, and after being dried in the open air is placed in a box containing a hygroscopic material, the dampness of which causes the gelatine to swell slightly, and so increases the amount of relief. The secret of M. Michaud's process consists in pressing this gelatine film into the plastic face of a fusible metal, which is contained in suitable trays or dishes. The "forme," as it is called, is treated in much the same way as the mold and block in the process of electrotyping, being placed under a screw press, and allowed to remain until the metal becomes solid. The fusible metal employed by M. Michaud is Darcet's alloy, with the addition of about 11 per cent. of mercury. The alloy of Darcet or Rose is usually compounded of bismuth, 50; tin, 30, and lead, 20, and is fusible at 212° F.; but other pro-

portions of these metals, for there are many alloys of Darcet, produce differences in the metal which may be found of especial value in the new process. Thus an alloy of bismuth, 80; lead, 70; tin, 10, becomes soft in boiling water, but does not melt; while one made up of bismuth, 80; lead, 40; tin, 40, becomes very liquid at 212°. If the quantity of lead in the last is reduced to 30 parts the alloy becomes liquid, but not very fluid at 212°. The addition of mercury to any of these alloys reduces the fusing point below the temperature of boiling water, and it is possible that, by adding 11 per cent., M. Michaud may have obtained the metal best adapted to his wants—sufficiently hard when cool, and sufficiently fusible to be capable of taking the impression of the gelatine without injuring the fine lines. At any rate the proportion of mercury added will affect the degree of hardness within certain limits. The plate produced by impressing the gelatine on the semi-fluid face of the alloy can be employed for the production of other plates; but for the purposes of typography it will be seen that several operations must still be carried out in order to obtain a raised plate in hard metal from a sunk plate in a fusible alloy. When the picture required contains half-tones, it is necessary to obtain a grained surface. This is accomplished by means of a special film of colored bichromated gelatine, which is exposed under a plate dusted with a rather coarse opaque powder. The film thus produced is attached to the negative by means of a solution of gum arabic, containing a little bichromate of potash, the operation being performed under water. The parts not affected by light are then removed in the usual manner, and a negative is obtained with a grained surface from which the print is taken with which the impression is made.

In an English exchange we find the following description of the mode of manufacture of

PAPER FRICTION PULLEYS. They are made by cutting pieces of paste-board into a circular form, and of the desired diameter of the pulley, and placing them in layers one on the top of another, cementing properly with a good coat of glue between each layer, pounding or pressing them together as close as possible, and leaving a perforation in the center of each for the shaft. When enough of these layers have been got together to give the proper breadth of pulley, the glue is allowed to harden, then turned off to a smooth finish in a lathe. Each side of the pulley is secured with a good stout iron flange large enough to cover the entire diameter, or nearly so. With proper usage it will last a long time.

In an Austrian military paper a description is given of an

AUTOMATIC SIGNALING TARGET which was successfully tried recently. The face of the target is divided into a number of concentric rings, and each ring again is divided by two lines drawn right across the faces and crossing each other at right angles at the center. In each of the subdivisions of the target at the firing station a small hole is pierced, and when a bullet strikes the distant target a number at once appears in the hole in the corresponding subdivision of the target near the shooter, or, should the ball strike upon one of the lines dividing the face of the target, numbers are shown in both the adjacent subdivisions. In the trials made with the target the apparatus worked perfectly during the eight days for which the firing was kept up, the only accident which happened being that once the electric wire was cut by a bullet.

Overwinding in shafts has always been a serious danger, to avoid which a good many appliances have been tried. From a description of the

"JUSTICE" OVERWINDER, given in the *Virginia Enterprise*, it would seem that an unusually successful apparatus has been put in at the Justice mine on the Comstock lode. At the depth of 100 feet below the top of the shaft the cage moves a lever and half the steam is shut off at the engine. The cage then ascends at a moderate speed, passes the proper stopping place, and moves on upward toward the sheaves. Just before it reaches the point of danger, however, the cage presses another lever, a powerful brake is applied to the hoisting reel and the cage with its load is instantly stopped.

M. Rameaux has recently exhibited before the Société des Sciences de Nancy a

SIMPLE AND SENSITIVE ELECTROSCOPE. It consists of a fine fiber of white silk, fixed at one end by means of a little wax to any support, and free to oscillate in any direction under its point of attachment. A single thread would, of course, suffice for the ordinary purposes of electroscopy properly so called, but it is preferable to employ two near each other, taking care to space them so that they cannot foul each other during their swing, or influence each other reciprocally. One of the threads is charged by means of a glass rod with positive electricity. The other is charged by means of a stick of resin with negative electricity. Every body which attracts one of the threads so charged and repels the other is necessarily electrified. Its electricity is of the same sign as that of the thread which it repels. The sensibility of these electroscopes is greater within certain limits as the threads are made finer, longer and less conducting.

A very simple **LOCKING PLATE FOR NUTS** has been invented by James Finney, of Braintree, England. A small pin is fixed a short distance beyond the nut. A circular plate, divided equally by 17 notches, fits easily over the nut in any of its six positions. The principle of the invention is the same as that of the vernier scale. As there are 17 notches in the plate it follows that three of them represent just one-seventeenth of one side of the hexagon nut; so that if the plate be moved round three notches, it will not fit unless the latter be moved round a distance equaling one-seventeenth of one side of the hexagon, or a distance which equals the one hundred and second part of a whole turn. The cost of the plate is small, as it can be made with sufficient accuracy of cast iron.

Trades Unionism at Birmingham.

A feeling of surprise, not unmixed with indignation, has been excited within the last few days among the commercial community of Birmingham by the unlooked-for discovery in their midst of a trades union of spirit as arbitrary and pretensions as monstrous as any of those formerly controlled by Broadhead and his associates, though happily without the strength for evil which once made "Mary Ann" the terror of Sheffield industry. The cut-nail makers' union, whose proceedings have nearly been the subject of investigation by the local magistrates, appears to be modeled on the good old plan of subordinating the interests and liberty of the many to the selfish tyranny of the few, and making the employer, as far as possible, the thrall and bondsman of his workpeople; and the only marvel is, on glancing through the rules, that it should ever have been possible to enforce them in a liberty-loving community like that of Birmingham, and that it should have been reserved for the present year of grace to witness the first serious uprising against them. By one rule of this precious union it is laid down that no member shall apply for or take a situation without the consent of the committee; consequently, any manufacturer employing union men is restricted to such as the union choose to find him, or he must keep his machinery idle, though steady, skillful workmen are waiting at his gates for employment. By another rule it is decreed that in case of the illness of a workman, however protracted, his employer must not engage another man, even a unionist, to mind his machines in the interval—no, not even on the understanding that the deputy shall vacate his post on the recovery of the man he has temporarily replaced. The result is that when, from excesses of any kind, as frequently happens, a nail-minder is laid up at home for a month or two, the whole of the six machines on which he is usually engaged, and the six feeders employed on them, are thrown out of work, to the serious loss not only of the employer, but also of the poor feeders—mostly women—who are dependent for their bread upon their earnings from week to week. There are other rules of the association scarcely less preposterous, but—*ex pede Hercules*—a sample will suffice to show the spirit in which they are conceived. It has devolved on Mr. Felix Hadley, of the Miter Cut-nail Works, Birmingham, the chairman of the associated nail manufacturers of the United Kingdom, and probably the largest employer of labor in that branch, to break the mischievous spell cast over men and masters alike by this tyrannical union, and to demonstrate to his brother manufacturers and the unionists themselves that it is possible to get on very satisfactorily without and in spite of them. Mr. Hadley, it should be stated, is an advanced liberal and a staunch advocate of freedom of union for all legitimate purposes; but the freedom he concedes to others he demands for himself, and, as he would not dictate to the workmen what employers they shall serve or what wages they shall accept, neither will he permit them to dictate to him any longer what men he shall or shall not employ, or what wages he shall pay them. Accordingly, a few weeks ago, a vacancy having arisen in his establishment, he engaged to fill it with a Wolverhampton workman, who came to him with high recommendations, but who was not a unionist. So soon as the new-comer made his appearance in the workshop, the other men in the same shop, to the number of between 30 and 40, immediately struck work, throwing out of gear some 200 machines and paralyzing the industry of as many feeders, and sent word to their employer that they would not resume until the new-comer was withdrawn. Mr. Hadley refused to accede to so unjust a demand, but stated that if the man was objectionable either as a shopmate or a workman, he was prepared to discuss the matter with the malcontents on the conclusion of the day's work, and to take what course might then appear desirable. The men, however, insisted upon the unconditional surrender of their employer, and as his sense of justice and personal dignity revolted against such pretensions, they left the works in a body at a minute's notice, though reminded that by the terms of their engagement they were bound to give a fortnight's notice before leaving. Mr. Hadley allowed the strikers a day or two to reconsider their conduct and cool down, and after warning them in writing of the consequences of persistence in so wanton a strike, engaged non-unionist men to fill their places. The new men are described as steady, sober, respectable fellows, far superior in sobriety and general morality to the unionists they have replaced, and the dispute which led to their engagement is regarded by the rest of the establishment as one of the luckiest things that could have happened for the community. The unionists, however, were evidently resolved not to give up the struggle without a blow or a kick for their lost position, and so on the evening of the day on which the new men went to work they waylaid them, and treated one of them—Rogers—so brutally that but for the interference of the police the assault might not improbably have resulted in murder. For this assault two men were on Wednesday week committed by the Birmingham magistrates to six weeks' and one month's hard labor respectively, and nothing but flight has preserved the other ringleaders from receiving like punishment. By these convictions, brought about by the violence of the unionists themselves, the strength of the union is practically broken down, and as the cut-nail makers throughout the kingdom have now pledged themselves not to engage men at the sole dictation of the union, or without good characters from their last employers, the occupation of the strikers is evidently gone, and "the engineer" has been once again "hoist with his own petard." It should be understood that, although the nail minders are among the best-paid operatives in Birmingham, this rupture is totally unconnected with any question of wages. Mr. Hadley was at the trouble to take out of his books the amount paid in wages last year to the six ringleaders of the strike, and after deducting all expenses and losses for holidays, sickness and drinking sprees, it appears that the men earned, even in that bad

year, from £150 to £200 net each, the average being about £175. It is no uncommon thing for a nail minder to net £4. 15/ or £5 per week for comparatively light work and short hours, yet they are found quarreling in this way with their bread and butter on a question with which they have neither legal nor moral right to interfere.—*The Iron-monger.*

Failures in the West.—On the 20th ult. the Union Iron Works Company, Cleveland, Ohio, made an assignment to J. M. Henderson, attorney. The liabilities are \$215,000 and the assets \$100,000. The company employs 1000 men and has extensive mills. The immediate cause of the failure was the inability of some of their heaviest debtors to meet paper which was due.

The Northern of France Railway Company have just let contracts for 50 locomotives to various companies. Thus, 20 engines have been ordered from the Alsacian Company at Mulhouse, 20 from Creusot and 10 from the Fives Lille Company. The company also proposes to undertake the construction of 10 more engines in its own workshops, so that altogether 60 engines are about to be built. The demand for iron has not been very well sustained at St. Dizier. Rails are in small request. Important contracts for rolling stock are about to be let at the North Brussels station for rolling stock required for the Belgian state railways.

Special Notices.

HIGHLY IMPORTANT TO PRACTICAL MEN. Architectural Iron Work.

A practical work for Iron Workers, Architects and Engineers, and all whose trade, profession or business connects them with architectural iron work, showing the organization and mechanical and financial management of a foundry and shops for the manufacture of iron work for buildings, with specifications of iron work, useful tables and valuable suggestions for the successful conduct of the business, with many fine wood engravings. By Wm. J. FAYLE. 8 vo., cloth, \$3.50 (Send for circular with full description.)

A WORK OF GREAT PRACTICAL VALUE TO THE FURNACE OWNER, ENGINEER OR MANAGER. Whitwell's Iron Smelter's Pocket Analysis Book.

Prepared for the various materials used in an Iron and Steel Works, or by the Metallurgical Engineer. Oblong, full bound, \$3.00.

The Calculations of Strength and Dimensions of Iron and Steel Constructions.

With reference to the latest experiments. By Prof. J. J. Weyrauch, of Polytechnic Institute of Stuttgart. Translated by A. J. Du Bois, Esq., cloth, with plates. The best and only accurate and authorized edition. \$1.50. "No one interested in constructions involving the use of iron or steel can afford to ignore any longer the results here set forth."

MANUFACTURERS OF Hardware Specialties

will find an opportunity for securing the control of a tool which should be in the hands of every mechanic. For a new tool it has met with great success wherever introduced. There is a growing demand for it. Present manufacturers desire to dispose of it in consequence of their own business, which is of a different character, requiring all their attention and capital. Address "SPECIALTY," Office of The Iron Age, 220 S. 4th St., Phila., Pa.

LEHIGH UNIVERSITY Tuition Free. CIVIL, MECHANICAL AND MINING ENGINEERING; CHEMISTRY AND METALLURGY; FULL CLASSICAL INSTRUCTION; FRECH AND GERMAN; ENGLISH LITERATURE; INTERNATIONAL AND CONSTITUTIONAL LAW; PSYCHOLOGY AND CHRISTIAN EVIDENCES. For Registers address The REV. JOHN M. LEAVITT, D. D., President, Bethlehem, Penn.

SALESMAN WANTED

to introduce two articles of Hardware on commission. Can sell them with other goods. Address "SPECIALTIES," Office of The Iron Age, 83 Reade St., N. Y.

FOUNDRY.

Wanted to lease for a term of years, in New York or vicinity—on tide water preferred—foundry well adapted for both light and heavy work. Address, POST OFFICE BOX 2412, N. Y.

To Manufacturers, &c. FLOWER PINS.

Something new, made of light wire, for the use of florists and others. Patent lately allowed, and offered for sale in whole or part. Specimen card of pins sent for examination, if desired, or for further information address the inventor, J. H. PLUMMER, 1276 Pacific St., Brooklyn, N. Y.

A Rare Chance.

The undersigned, being without capital, desires to dispose of the patent right of his Universal Cash Register. This machine is for use mainly in retail stores. It effectually prevents irregularities on the part of employees, as it registers the number of sales, the amount of cash received, and also issues a duplicate receipt to be given to purchaser if required. Would grant exclusive rights to manufacturer to a suitable party. Correspondence solicited. Send for circular to A. A. ANDERSON, Box 616, Petrolia, Pa.

BOOKKEEPER AND ACCOUNTANT.

An expert Bookkeeper and Accountant, of long experience in iron works and mine offices, desires an engagement. Is perfectly familiar with every detail of the business, and understands keeping accounts, records of working, cost of product, &c. Best references in this country and England. A good position will be taken at a moderate salary. No preference as to location. Address, J. M. H., Office of The Iron Age, 83 Reade St., N. Y.

Special Notices. BISSELL & WELLES, AUCTIONEERS.

Office of THE TABLE CUTLERY ASSOCIATION OF THE U. S., NEW YORK, July, 1878.

TO THE TRADE: Hereafter all "Seconds" made by the members of this Association will be sold at auction through Messrs. Bissell & Welles, Auctioneers, at their salesroom, No. 83 Chambers and 65 Reade streets. No sale of Seconds will be made in any other way.

By order of the Association, R. N. OAKMAN, Executive, C. S. LANDERS, Committee, B. B. YALE, Committee, H. A. CURTIS.

Referring to above announcement, we will state to the trade that we will make our first sale of Seconds for the Association in our trade sale of August 27 and 28.

BISSELL & WELLES, AUCTIONEERS.

AUGUST LIST, No. 1.

MACHINE TOOLS, Second-Hand.

Two Woodruff Steam Engines, automatic cut-off, cylinder, 30 inch diameter, 48 inch stroke. One Portable Engine, 7 in. cylinder. One No. 3 Stiles Geared Press. One No. 2 Fowler Press. One Crank Planer. One Sellers 50 lb. Steam Hammer. One 600 lb. Drop Hammer. One Hand Milling Machine. One "Pond" Index Milling Machine. Three Chase Patent Pipe Cutting Machines. Two Engine Lathes, 13 in. swing, 6 ft. bed. Two Engine Lathes, 22 in. swing, 8 ft. bed. One Engine Lathe, 70 in. swing, 35 ft. bed. One Engine Lathe, 15 in. swing, 6 ft. bed. One Engine Lathe, 25 in. swing, 7 ft. bed. Three Engine Lathes, 20 in. swing, 6 ft. bed. Two Engine Lathes, 22 in. swing, 8 ft. bed. Six Turning Lathes, 14 in. swing, 3 ft. bed. Three spindle Drills. One 22x32x6 ft. Planer. One 48x82x12 ft. Planer. One 8 in. Shaper. One Gear Cutter. One new "Hardway" Bolt Heading Machine, to head up to 3/4 in. bolts. One new "Hardway" Bolt Heading Machine to head up to 1 1/2 in. bolts. A lot of Saw Tables and Wood Working Machinery. Please specify which of the above tools you want and we will forward all particulars. The above tools will be sold very low, and can be seen at

The George Place Machinery Agency, 191 Chambers and 103 Reade Sts., N. Y.

To Steel-Manufacturers.

An energetic young man with scientific training, who has had experience in the manufacture of Bessemer and Crucible Steel, in preference to remaining unemployed would be willing to take a subordinate position with the prospect of being employed as blower or Bessemer or as melter in Siemens-Martin steel works. Highest recommendation as to integrity, character and ability furnished. A correspondence, which shall be strictly confidential, respectfully solicited. Address, Box 1308, New York.

Second-Hand Machinery.

One 14 in. x 30 in. Whitehill & Smith Adj. Cut-off Engine, Wheel 10 ft. diam., and One 54 in. x 16 ft. Tub'r Boiler for same; both almost new. One 10 in. x 24 in. Fishkill Landing Engine, and One 10 in. x 14 ft. Tub'r Boiler for same. One 10 in. x 24 in. Harris Corliss Engine, with Boiler, Pump and Heater, never run, price very low. One 26 in. x 17 1/2 ft. Engine Lathe, Rod and Cross Feed. One 22 in. x 10 ft. Engine Lathe, Pond; all improvements. Two 15 in. Pratt & Whitney Engine Lathes, with Taper Attachment. One Lincoln Gear Cutter, nearly new. Two Lincoln Milling Machines. Four Brainard Milling Machines. One each 1, 2, 3 and 4 spindle Drills. One 8 in. x 10 ft. Root Blower. One 80 lb. Merrill Drop Hammer, good as new. 70 feet 22 in. Double belt. 35 ft. 10 in. Double Belt.

E. P. BULLARD, 14 Dey St., New York.

A Rare Chance.

FOR SALE, an established Hardware Business of 16 years' standing, in a Western city. Location unexcelled. Capital required, \$10,000. Suggest the cause of desire to sell. For particulars address LOCK BOX M, Philadelphia P. O.

SITUATION WANTED—As clerk or traveling salesman. Have had five years' experience in the above positions in the hardware business. Good references furnished. Am not afraid to work, and willing to make myself useful. Small salary expected. Address G. J. W., Office of The Iron Age, 83 Reade St., N. Y.

WANTED.

In every city in the United States, a responsible and well-known party to represent us. PHILADELPHIA HYDRAULIC WORKS, Philadelphia, Pa. Cor. Erelina & Levant, near 3d & Spruce Sts.

For Sale, Valuable Manufacturing Property.

Foundry and Machine Shop capable of producing the heaviest work. Large and room, a good wharf and railroad connection by spur track. Situated at South Norwalk, Conn. Terms reasonable. E. HILL, Trustee.

For Sale,

A new, clean stock of Iron, Heavy Hardware, Wagon Wood Stock and Agricultural Implements, with a good established trade, both wholesale and retail, in a thriving Western city. Reason for selling: Party wishes to confine his business exclusively to Jobbing Shelf Hardware. For further particulars, address F. & C. O., Office of The Iron Age, 83 Reade St., New York.

Special Notices. JENNINGS'S COMBINATION DISCOUNT TABLES.

(Published by the author.)

This Book contains 1500 tables for single and combination discounts, such as 17 1/2 %, 45 %, 10 & 7 1/2 %, 15 & 5 %, 25 & 10 %, 33 1/3 & 25 %, 35 & 7 1/2 & 25 %, 45 & 5 & 10 %, 60 & 10 & 5 & 10 %, 65 & 5 & 10 & 2 %, 65 & 10 & 5 & 10 %, 75 & 15 %, &c., &c., which are so arranged as to be found without loss of time, and by their use either the Discount or Net on any amount of dollars and cents, from a penny to one million dollars, can be ascertained in a few seconds entirely by Addition. Just the thing for making or proving invoices, finding Net Value of goods bought or sold, and comparing different Discounts, thereby saving time, blunders and Headwork. Size of Book, 11 inches long by 9 inches deep. Contents, 50 pages, 30 Tables on a page, solid figures. A copious Index, &c.; 70 pages in all. Editorial Notice from The Iron Age, dated Feb. 21, 1878.

We have received from Mr. S. H. Jennings, Deep River, Conn., a copy of his new book, entitled "Jennings's Combination Discount Tables," and after a careful examination we very cheerfully commend it to the trade, believing it will fill a want that has hitherto been unsupplied. The book contains 1500 tables for single and combination discounts, such as 35 per cent., 37 1/2 per cent., 25 and 5 per cent., 60 and 5 and 7 1/2 and 2 per cent., &c., which are so arranged as to be found without loss of time, and by their use either the discount or net, on any amount, from a penny to one million dollars, can be ascertained in a few seconds, entirely by addition.

By a novel arrangement of the tables they work equally well on either cents or dollars. Their principal uses are proving invoices received, making or proving bills of goods sold, and finding the net cost of separate articles on invoices of goods bought; but aside from this, the work being very comprehensive in its character, in fact covering the whole field of discounts, it must prove valuable as a book of reference when it is desired to compare different discounts, or to ascertain what results certain changes in prices would accomplish. We understand that it is highly spoken of by those who are using it, and we see no reason why it should not become a standard work for discount purposes so soon as its merits are known and appreciated. The publisher offers to send the book by mail, postpaid, to any address, on receipt of the price, \$3. This price seems moderate when the labor of compilation is considered, the quality of the paper, the printing, binding, &c., all of which show care and determination on the part of the author to furnish a book that should be accurate, and which with ordinary care will last a lifetime.

It will be mailed, postpaid, to any address, on receipt of the price, \$3. Currency may be sent by mail at my risk. Address

S. H. JENNINGS,

Deep River, Conn.

J. H. JENKS & CO., Manufacturing Machinists

180 Centre Street, New York, are prepared, with a superior equipment of first-class tools and experienced mechanics, to contract for the designing and construction of special TOOLS, DIES, JIGS and GAUGES for duplicating interchangeable parts of the machinery or sheet metal goods. Contracts for manufacturing staple goods in quantity solicited.

Second-Hand Machinery For Sale Low.

SEND FOR LIST.

Engine Lathe, built by Seth Wilmarth, 22 in. swing, 23 ft. bed, live spindle hollow, face plate both ends, one at front 6 ft. 4 in. diameter, one at rear 7 ft. 1 1/2 in. diameter, two boring bars traveling by tail spindle, both arranged for spinning key ways; one of these bars is designed for work on rear face plate and has yoke to support outer end; on either face plate work may be bored, turned and splined without removing the fastenings. At rear face plate an adjustable bed 17 feet long carrying an adjustable tool rest, the latter having 3 ft. 6 in. traverse, arranged to sit at any angle and in any position on above bed. Tail spindle is 3 1/2 in. square, carriage is fed by a screw the full length of bed, cross feed automatic, 6 grades of feed to operate either, 10 grades of speed for live spindle, driving movement gears direct to front face plate, complete with counter-shaft for driving, splining and feeding. One large saddle or center rest. Planer, built by W. Collier & Co., Salford, Eng., planes 54 in. wide, 48 in. high, 18 ft. long, automatic cross, vertical and angular feed, plate driven by gearing into step rack, return motion about 3 to 1; has third upright with vertical tool slider, automatic feed, to plane work that will not pass between the regular uprights. This slider has a vertical movement of 5 ft. 4 in. Counter-shaft. HOLYOKE MACHINE CO., Holyoke, Mass.

HARDWARE BUSINESS FOR SALE.

In one of the most thriving towns in Pennsylvania, about 75 miles from Philadelphia, a well selected stock of Hardware of about \$15,000 and doing a retail cash business of \$75,000, is offered for sale on low and easy terms. Willing to retire from business reason for selling. Address, K. T. B., Office of The Iron Age, 220 S. 4th St., Philadelphia.

SPECIAL NOTICE.

The undersigned offer their services as agents to American Producers of Metals. They represent foreign brands of Zinc, Russia Iron, Hoop Iron, Window Glass, Cutlery and Guns. LOUIS WINDMULLER & ROELKER, 20 Reade Street, N. Y.

For Sale.

Twelve horse-power hoisting engine (no boiler), \$350; an eight horse-power hoister, with boiler, \$400; three six horse-power hoisters, with boilers, \$295, \$367 and \$350, respectively. All second hand; but little used; in excellent order. Also, 1200 new and second-hand machines of every description, at prices far below their actual value. Send stamp for printed list, with prices annexed, fully describing all, stating just what you want. S. C. FORSAITH & CO., Machinists and General Machine Dealers, Manchester, N. H. N. B.—Special low freightage obtained for our patrons to any section of the United States or Canada.

Special Notices. W. GARNER, General Merchant,

Mouldsworth, near Chester, England,

Supplies nearly every class of Goods, including all kinds of

Agricultural Machinery, Domestic Machines, SEWING MACHINES

And Artificial Manures.

W. GARNER is open to represent any Foreign Manufacturers in England for the sale of their manufactures of whatever nature or kind. Having a wide and well established connection in the Provinces, could introduce some American, German and French products to mutual advantage. W. GARNER is also open to buy any kind of Goods on commission, and ship them to any part of the world. Manufacturers or others desiring his assistance will please address (with full particulars in English) as above.

To Manufacturers and Jobbers of Hardware, Cutlery, &c.

Manufacturers and Jobbers, having surplus stocks or goods that from any cause are unsaleable upon which they wish to realize, or assignees who have stocks to dispose of, will find a cash purchaser by communicating with.

W. M. CALDWELL, Dealer in Job and Auction Lots of Hardware, Cutlery, &c., 102 Chambers St., New York.

AUSTRALIA.

AMERICAN HARDWARE CO., No. 9 WILLIAM STREET, MELBOURNE, AUSTRALIA. Solicit correspondence with American manufacturers desirous of representation in the Australian Colonies. Consignments will have prompt attention. References furnished.

PRICE BOOKS

FOR

General Hardware.

Half Leather, \$10.00. Full Leather, \$12.00.

POCKET EDITION Just Out.

Fine Leather Binding, \$5.00. Send for circular.

Buell Lamberson,

97 Chambers St., N. Y.

MILLET & BILGER,

Auctioneers and Commission Merchants

112 Chambers St., New York, Solicit from manufacturers, importers and jobbers consignments of Hardware, Cutlery, House Furnishing Goods, &c., &c., for their regular weekly sales. C. A. MILLET, J. M. BILGER, formerly of Bissell, Welles & Millet. R. T. Hatzel & Co.

\$8000

Equity in desirable country residence, 20 miles from New York (some cash if necessary), for good business. Hardware or groceries preferred. Address, with full particulars, for two weeks, H. C. A., Office of The Iron Age, 83 Reade St., N. Y.

The Sherman Process Co.

9 Pemberton Square, Boston, Mass.,

Issue Licenses to use the Process for the Manufacture of Iron and Steel

In the Bessemer Converter, Crucible, Siemens-Martin, Puddling, Blast and Cupola Furnaces. The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working. See page 17 of The Iron Age of Oct. 25th, 1877.

Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy. A practical man with means is wanted to join a practical man who is already well established. Address OAR WHEEL FOUNDRY, P. O. Box 134, Selma, Alabama.

HARDWARE BUSINESS FOR SALE.

Rare chance to purchase stock of a well-established business in central Illinois. Stock will invoice about \$6,000. The best of reasons given for selling. Address "HARDWARE," Office of The Iron Age, 83 Reade St., N. Y.

DROP FORGINGS.

The TRENTON VIEW & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings

in quantities to order at reasonable rates. HERMAN BOKER & CO., Proprietors, 101 & 103 Duane St., N. Y.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address, IRON AND STEEL, Care of P. O. Box 813, Bridgeport, Conn.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, July 31, 1878.

The past week has been one of much interest in the financial markets. Money continues easy at 1 @ 2 % on call, and 2 1/2 % on prime business paper.

The fluctuations in the gold premium have been comparatively unimportant, the extremes having been 100 1/2 and 100 3/4.

Government bonds have been strong and active, owing to an extraordinary demand resulting from the calling in of another block of 50,000,000 of 5-20's. State bonds are quiet and steady; railway mortgages strong. We give below the closing quotations of governments.

The stock market has been weak, and prices have declined, led by railway shares, which were depressed by reports of a failure of the crops in the Northwest, circulated in the interest of the Chicago grain speculators. The principal dealings have been in St. Paul, Northwestern, Lake Shore, Western Union, and Delaware, Lackawanna and Western. We give below the closing quotations of active shares.

The latest weekly statement of the New York banks shows a reduction of \$2,306,000 in the specie average, due, it is believed, to the heavy subscriptions to the United States 4 per cent. bonds, which operate to transfer gold from the banks to the Treasury. The legal tender note average is \$365,700 higher than a week ago, and \$1,084,400 higher than during the corresponding week a year ago. The total reserve is \$1,440,300 lower than a week ago, and the surplus reserve \$1,660,700 lower, the reduction in the latter being larger on account of the increase in deposit liabilities. The surplus reserve is now \$2,571,775, where a year ago it was \$16,776,100. The following is a comparison of the bank averages for the last two weeks:

	July 20.	July 27.	Differences.
Loans.....	\$236,195,500	\$238,636,000	Inc. \$2,440,500
Specie.....	22,001,600	19,695,600	Dec. 2,306,000
Legal t'nd'ts	57,143,900	58,409,600	Inc. 1,265,700
Deposits.....	221,254,100	223,133,700	Inc. 889,600
Circulation.....	19,405,100	19,078,000	Dec. 327,100

The movements in foreign trade for the week are shown in the following tables:

For week ended July 27:

	1876.	1877.	1878.
Total for week.	\$5,168,729	\$6,217,603	\$4,080,659
Prev. reported.	170,095,460	190,327,023	158,778,213

Since Jan. 1.....\$175,264,189 \$166,545,226 \$163,758,872

Included in the imports of general merchandise were articles valued as follows:

	Quantity.	Value.
Anvils.....	85	\$903
Brass goods.....	4	509
Bronzes.....	2	497
Chains and anchors.....	22	1,124
Cutlery.....	49	11,774
Gas fixtures.....	2	1,089
Guns.....	12	744
Hardware.....	54	9,559
Iron, sheet, tons.....	15	1,308
Iron, other, tons.....	15	50,960
Nails.....	32	8,917
Needles.....	2	331
Old metal.....	2	1,042
Platina.....	2	7,579
Per. caps.....	14	3,411
Saddlery.....	12	744
Steel.....	98	11,434
Silverware.....	5	347
Tin, bxs.....	29,893	135,636
Tin, 3/4 slabs.....	280,529	39,613
Wire.....	3	3,991
Zinc.....	27,742	1,370

EXPORTS, EXCLUSIVE OF SPECIE.

	1876.	1877.	1878.
For the week.....	\$5,427,839	\$5,140,795	\$7,460,868
Prev. reported.....	143,574,440	150,244,782	180,593,815

Since Jan. 1.....\$149,002,279 \$155,385,577 \$197,054,683

EXPORTS OF SPECIE.

	1876.	1877.	1878.
Total for the week.....	\$321,992	\$286,060	\$286,060
Previously reported.....	8,885,060	8,885,060	8,885,060

Total since Jan. 1, 1878.....\$9,208,052

Same time in 1877.....21,141,889

Same time in 1876.....59,912,986

Same time in 1875.....33,355,067

Same time in 1874.....37,293,383

Same time in 1873.....30,161,750

Government bonds close as follows:

	Bid.	Asked.
U. S. Currency 6's.....	107 1/2	107 3/4
U. S. 6's 1881 registered.....	107 1/2	107 3/4
U. S. 6's 1881 coupon.....	107 1/2	107 3/4
U. S. 6's 1886 new reg.....	107 1/2	107 3/4
U. S. 6's 1886 coupon.....	107 1/2	107 3/4
U. S. 6's 1887 reg.....	107 1/2	107 3/4
U. S. 6's 1887 coupon.....	107 1/2	107 3/4
U. S. 6's 1888 reg.....	107 1/2	107 3/4
U. S. 6's 1888 coupon.....	107 1/2	107 3/4
U. S. 10-40 coupon.....	107 1/2	107 3/4
U. S. 10-40 registered.....	107 1/2	107 3/4
U. S. 5's 1881 coupon.....	107 1/2	107 3/4
U. S. 4 1/2's 1881 coupon.....	107 1/2	107 3/4
U. S. 4 1/2's 1881 coupon.....	107 1/2	107 3/4
U. S. 4 1/2's 1881 coupon.....	107 1/2	107 3/4
U. S. 4 1/2's 1881 coupon.....	107 1/2	107 3/4

The following were the closing quotations

Atlantic and Pacific Telegraph.....	26	27
Chicago and Northwest.....	107 1/2	107 3/4
Chicago, Rock Island and Pacific.....	112 1/2	112 3/4
Chicago, Burlington and Quincy.....	111 1/2	111 3/4
Col. Chicago and Ind. Central.....	111 1/2	111 3/4
Clev. Col. and Ind. Central.....	111 1/2	111 3/4
Cleveland and Pittsburgh.....	80 1/2	81
Chicago and Alton.....	82 1/2	83
Canton.....	17	19
Delaware, Lack. and Western.....	58 1/2	59 1/2
Delaware and Hudson Canal.....	54 1/2	55 1/2
Express-Adams.....	102 1/2	103 1/2
"American.....	45 1/2	46 1/2
"United States.....	45 1/2	46 1/2
"Wells, Fargo & Co.....	92 1/2	93 1/2
Erie.....	18 1/2	19 1/2
Harlem.....	35 1/2	36 1/2
Hannibal and St. Joseph.....	11 1/2	12 1/2
Illinois Central.....	26 1/2	27 1/2
Kansas and Texas.....	83 1/2	84 1/2
Lake Shore.....	25 1/2	26 1/2
Michigan Central.....	64 1/2	65 1/2
Morris and Essex.....	84 1/2	85 1/2
Milwaukee and St. Paul.....	35 1/2	36 1/2
New York Central.....	108 1/2	109 1/2
New Jersey Central.....	38 1/2	39 1/2
New Jersey Southern.....	13 1/2	14 1/2
Ohio and Mississippi.....	73 1/2	74 1/2
Pacific Mail.....	16 1/2	17 1/2
Panama.....	20 1/2	21 1/2
Pittsburgh and Fort Wayne.....	94 1/2	95 1/2
Quicksilver.....	12 1/2	13 1/2

St. Louis Kansas City Northern.....	4	4 1/2
Toledo, Wabash & Western.....	14	14 1/2
Union Pacific.....	62	62 1/2
Western Union Telegraph.....	82	82 1/2

GENERAL HARDWARE.

There is nothing to report this week in the matter of changes in values of General Hardware. At the low prices ruling at present the market is fairly steady, and a slight improvement in demand over the previous week is generally reported. There are some buyers in town from the South and Southwest.

The Iron Age appears this week with a cover giving in French a synopsis of our advertising pages. This cover is printed for the convenience of European readers, who are thus given a better idea of the amount, variety and interest of our advertising. The Iron Age has attracted much attention at the Exhibition, and the gentlemen in charge of our exhibit have had difficulty in making the judges and visitors understand and believe that the copies of our regular weekly editions sent abroad for distribution were not specially prepared for the purpose. That it is possible in the United States to sustain a journal of forty to forty-eight pages weekly, containing such a mass of matter, so excellent in every department and so superior in mechanical execution, seems to them, accustomed as they are to European journalism, an impossibility of which even ocular demonstration cannot convince them. There is nothing in the way of trade or technical journalism in Europe which can compare with it, and copies are eagerly sought and prized as curiosities. The object of printing a cover in French was to furnish foreign readers a convenient directory of the Iron, Steel, Hardware and Metal trades of the United States, and give our advertisers the benefit of having their announcements appear in a language which nearly all Europeans can read, and which will give our large foreign edition additional interest and value.

The American Screw Company make an important announcement in their advertisement on page 17. It is that on Wednesday, August 21st, three weeks from to-day, they will sell at public auction, through Bissell & Welles, 83 Chambers and 65 Reade streets, N. Y., beginning at 10 o'clock a. m., 500,000 gross of best quality Gimlet Pointed Flat Head Wood Screws. This sale is pre-emptory. The conditions are as satisfactory as they can be made, and it is the aim of the American Screw Company to make the sale in the broadest sense popular. The goods will be put up in lots to suit all classes of buyers, and unless otherwise agreed, buyers will be required to take the usual proportion of sizes. The object of this arrangement is obvious. Goods will be delivered f. o. b. at Providence, and through bills of lading will be obtained when desired. The terms are cash in 30 days from date of sale for approved credit. Dealers unable to attend the sale are informed that they can secure what they desire by authorizing the auctioneers or their correspondents in New York to buy for them. On purchases of lots less than a full case an extra charge of 2 1/2 per cent. will be made for packing. We do not need to say that this is one of the most important announcements ever made to the Hardware trade of the United States. A great trade sale of this kind is an experiment in this branch of business, and its results will be awaited with eager interest by the whole trade. The American Screw Company have had it in contemplation since early in the spring, but finding that the dealers held large stocks and would be inconvenienced by any action which might seem to threaten the stability of values, they have postponed the sale until the date named, and given ample notice of it in advance. Meanwhile they have consulted the opinions of the trade, and are satisfied that their action is proper and desirable for them and favorable to the interests of dealers. It is natural that wide differences of opinion should exist as to the results of so radical a departure from the established usages of the Hardware trade, but as the event is now definitely announced and the date fixed, discussion would be profitless.

Henry Disston & Sons' File Co., Limited, illustrate in their advertisement on the 33d page, some of the leading styles of Files. They desire to inform the trade that owing to the steady increase in the demand for these goods since they were first placed on the market, they have increased their productive capacity, which is now equal to 500 dozen daily, an increase of nearly 200 dozen per day over their capacity last spring. All of these goods are fully warranted, and we have seen some very flattering testimonials regarding their cutting and lasting qualities.

The following circular explains itself:

Office of the KEYSTONE SAW, TOOL, STEEL, AND FILE WORKS,
PHILADELPHIA, PA., July 30, 1878.

To the Hardware Trade: As some manufacturers have placed on the market Hand Saws which they style No. 7, and as some persons may possibly be misled and purchase such goods when they really want Disston's Celebrated No. 7 Hand Saw, we take this means to caution the trade and public.

Our No. 7 Hand Saw has gained for us a reputation for excellence which is world wide. Every Saw of this quality has etched on the blade (in addition to No. 7) our well-known trade mark (a keystone and scales) and "Henry Disston & Sons, Philadelphia, Cast Steel, Warranted, Patent Ground," and without this brand name are genuine.

Any Saw marked "Henry Disston & Sons" proving defective in any particular will be exchanged and a perfect Saw given in its stead. HENRY DISSTON & SONS.

The close of the month, is very light. Regarding prices there is little change to notice, although for the more popular brands there is a tendency toward better figures than the minimum rates, and we hear of a good many sales of such at \$2.30, net, in a small way. We quote rod, to 60d., \$2.30 @ \$2.25, according to quantity, but for larger orders for prompt delivery these figures could be shaded a trifle. The Western Nail Manufacturers' Association held a meeting in Pittsburgh to-day but no action either in regard to production or price was taken.

In Foreign Hardware we hear of a slightly improved demand. No changes in values for the coming season have yet been announced and the general belief is that leading Foreign goods will continue firm at the prices which ruled last spring. We have received the following joint circular:

BIRMINGHAM, ENG., May 22, 1878.

DEAR SIR: We beg to inform you that our partnership will expire, by effluxion of time, on the 30th of June next, and that it has been thought best to discontinue to trade under our present arrangements.

We avail ourselves of this opportunity to thank you for the confidence you have placed in us, which, as regards the greater number of our correspondents, has been extended over a long series of years. Referring you to annexed circular, we remain, dear sir, Yours, respectfully,

VAN WART, SON & CO.

BIRMINGHAM, ENG., July 1, 1878.

DEAR SIR: Referring to the circular overleaf, I beg to announce that I shall henceforth carry on business as a general merchant, under the firm of Van Wart & Co. at the premises lately occupied by the firm of Van Wart, Son & Co. and shall be happy to be favored with your orders, assuring you that no effort will be spared to give you entire satisfaction.

Having had a life-long connection with the firm of Van Wart, Son & Co., and been for the last eleven years partner in that house, I doubt not to be found worthy of your confidence. I remain, dear sir, Yours respectfully,

WILFRED VAN WART.

McCoy & Co., 134 and 136 Duane street, New York, are agents for the firm of Van Wart & Co.

We invite attention to the advertisement, on page 13, of the Scandinavian Padlocks, manufactured at the Conestoga Lock Works, Lancaster, Pa. The articles manufactured at these works are claimed to be in every respect equal to the best in the market.

Buck Bros., Millbury, Mass., inform us that they are making for the coming season an increased variety of Carving Tools for professionals, amateurs, youths and ladies. All of their Carving Tools are hand made, and are forged from the best quality of cast steel. Each tool is branded with the name of the firm and is fully warranted.

The following circular explains itself:

Office of THE McKINNEY MFG. CO.,
WATKINS LEXINGTON, N. Y.,
HAMILTON, Ohio, July 22, 1878.

DEAR SIR: After August 1, 1878, please address us at Pittsburgh, Pa., where we have built large and convenient shops especially adapted to our business, and with increased facilities we expect to keep a larger and more complete stock of goods, enabling us to fill orders promptly.

Our prices will be as they have been heretofore, as low as goods of first-class quality and finish can be sold.

Let us hear from you before ordering your fall stock, and oblige your friends,

McKINNEY MFG. CO.

Fernald & Sise, No. 100 Chambers street, have issued during the week a handsomely illustrated catalogue and price list of the goods of the manufacturers represented by them, excepting those of the Reading Hardware Co., B. Rowland & Co. and the Auburn Tool Co., whose illustrated catalogues will be sent to the trade with their own upon application. The book, which is substantially bound in flexible cloth, contains 148 pages. Among the goods illustrated we notice a good line of A. E. Deitz, Cabinet Locks, Bronze Metal Spring Pad Locks, Mortise and Rim Night Latches and Store Door Locks, Keys, &c.; T. W. Langstroth's Cylinder Locks and Latches; Brass Pad Locks, Underhill Edge Tool Co.'s Axes, Hatchets and kindred articles; Yerkes & Plumb's Hammers, Hatchets, &c.; Roy & Co.'s Hinges; S. H. & E. Y. Moore's "Climax" Barn Door Hangers, Anti-Friction Sliding Door Sheaves and Dumb Water Pulleys; William Schollhorn's Calipers and Dividers; McCracken & Moore's Locks, Knobs, &c.; Franklin Reed's Mining Knives and Trowels, Scrapers, Cotton Hooks, &c.; Thurston Knob Screw Co.'s goods; Mohawk & Hudson Mfg. Co.'s Lard Presses; Standard Mfg. Co.'s Enamelled Hollow Ware; Mann's Patent Metallic Sieves; Metal Stamping and Enameling Co.'s Patent Stone Iron Ware; Arlington Edge Tool Co.'s Chisels, Drawing Knives, &c.

The Table Cutlery Manufacturers' Association of the United States announce that in future all "seconds" made by them will be sold at auction by Bissell & Welles, at their salesroom, Nos. 83 Chambers and 65 Reade streets. The first of these sales of "seconds" will take place August 27th and 28th.

IRON.

American Pig.—There is not the slightest symptom of reviving business in the Iron trade. The sales reported during the week are only of small parcels for prompt delivery. Thus we hear of 300 tons Thomas No. 1 at \$18 and 200 tons other brands in lots at from \$17 @ \$18. We hear rumors of more furnaces on the Lehigh about to be placed on the retired list, but the information at hand is too vague to warrant any specific statement. We quote nominally: Foundry

No. 1, \$16.50 @ \$18; Foundry No. 2, \$15.50 @ \$17; Gray Forge, \$14.50 @ \$16.

Scotch Pig.—The only transaction we hear of is the sale of 100 tons Coltness, to arrive, on private terms. Quotations are unchanged, as follows: Glengarnock, \$23.75; Eglinton, \$22.75, and Coltness, \$24.

Rails.—There is some inquiry for Steel Rails for delivery early in the fall, and a sale is reported of 1000 tons Steel on private terms, November delivery. In Iron Rails nothing has transpired. We quote Steel, at mill, \$43 @ \$44, and Iron, according to quality, terms, &c., \$32 @ \$36.

Old Rails.—Continue inactive, and we repeat former quotations, viz., \$17 @ \$18, here, which is the nominal price.

Scrap.—No. 1 Wrought, from yard, is quoted at \$20 @ \$21.

METALS.

Copper.—The market remains sluggish and sales have been restricted for the week to 250,000 lb Lake Superior at 16¢ @ 16 1/2¢. Baltimore we quote nominally, 16 1/2¢. Nothing is transpiring in futures. English mail accounts to hand are dated July 15, when Copper was unaltered, Tough Ingots being worth 66¢; Best Selected, 67¢; and Sheets, 67 1/2¢. No change is reported from London per cable. It will be necessary in the future to watch closely developments in Chili. The republic has evidently suffered from the hard times and the great decline in the value of Copper. Its general trade fell off 20 % last year, and the financial difficulties which the government has to contend with are great. Whether the rumors circulating here that Chili has suspended specie payments are true, we have no means of ascertaining to-day, but at all events matters do not work smoothly down there, and the ruinously low price of Copper may seriously interfere with Chilean production in the near future. The market for Manufactured Copper is dull and the combination prices are unchanged. English Yellow Sheathing Metal nominally quoted 13 1/2¢, but only an occasional inquiry. We quote: New Sheathing Copper, 26¢; Braziers, 28¢, and Bolts, 28¢; American Yellow Sheathing Metal, 14¢ @ 20¢; Yellow Metal Bolts, 25¢, and English Yellow Sheathing Metal, 13 1/2¢, currency, in bond.

Tin.—The market is dull and declining, no confidence being felt in present prices. About 6000 slabs Malacca and Straits Tin are shortly due here. We quote large lots, in gold, as follows: Straits, 13 1/2¢ @ 14¢; English Refined is nominal; Common ditto, 13 1/2¢, and Banca, 17¢. The cable informs us that Straits Tin has declined to 66¢ at London and to \$18.25 per picul at Singapore. In writing from England, under date of July 18, they express themselves as follows: "Some L. & F. Ingots have sold somewhat below last week's quotations, but the market can hardly be said to have changed, current quotations being, L. & F. Ingots, 65¢; Refined, 66¢; and Straits, 66 1/2¢." Export from the Straits to the United States during the first five months of 1878, 28,127 piculs, against 25,630 in 1877; 17,066 in 1876, 25,646 in 1875, 19,433 in 1874, 14,729 in 1873, 23,146 in 1872, 21,107 in 1871, and 21,878 in 1870. Tin Plates.—The market is very quiet. We quote large lines, good per box, ordinary brands, as follows: Charcoal Bright, \$5.75 @ \$6; ditto Ternes, \$5.25 @ \$5.50; Coke Tin, \$4.80 @ \$4.87 1/2, and ditto Ternes, \$4.75. The following is from Liverpool, dated July 18: "Though buyers hold off still, for the most part, from Coke Tins, these keep pretty firm at last week's rates. Other descriptions, especially the better brands of charcoals, Tin and Ternes, are still held and no reductions obtainable."

Lead.—Since our last some 70 tons Common Domestic sold at 3.20¢, currency, since when the market has relaxed into quietude, but is nevertheless tolerably strong, and may be quoted 3.35¢ @ 3.37 1/2¢, currency, below which nothing can be had. Fine Domestic cannot be procured under 3 1/2¢, currency. They write from England under date July 18 as follows: "Lead has recovered any ground it lost, and values at date are: Spanish Pig, £16. 15/; English Pig, £17. 5/; and Sheet, £17. 10/." Manufacturers' prices remain the same; we quote: Bar, 5¢; Pipe, 5¢; Sheet, 6¢; Tin-Lined Pipe, 12¢; No. 1 Solder, 8 1/2¢; all less 10 % to the trade.

Spelter and Zinc.—There is a fair trade transacting in Common Domestic Spelter at 4 1/2¢ @ 5¢, currency. Out West the situation remains as favorable to holders as could be wished for; the output is still a reduced one, while the wants of the rolling mills are steadily gaining in magnitude, and they are buying Spelter in advance of future requirements. Refined may be quoted 8¢ @ 8 1/2¢, currency. Accounts have reached us from Breslau, Silesia, to the 16th July, when some further purchases of Spelter had been effected to satisfy local requirements, 2000 cwt. B. H. having been sold at 17.15 marks the 50 kilos, and 3000 Hohenlohe at 17.10. This shows great steadiness at the very source of principal production. Sheet Zinc.—The market is rather dull, and prices are to a great extent nominal. We quote: Domestic, 6 1/2¢ @ 6 1/4¢, currency, and Moselman, 7 1/2¢ @ 7 3/4¢, gold.

Nickel.—The market remains steady, although quiet, at \$1.10 @ \$1.25, currency, 2¢ lb.

Antimony.—The demand here is moderate at 11 1/2¢ @ 12 1/2¢, gold, 2¢ lb. It costs all of the latter figure to lay down the Cookson brand here, even by taking 100 casks in a lump.

OLD METALS, PAPER STOCK, &c.

We have nothing new of any consequence to report in the condition of this market. Junk dealers are still complaining of dullness in business, but as we find them always busy it may be questioned whether these complaints of hard times and small profits are not simply an echo of the prevailing public sentiment in business circles.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy.....	per lb. \$0.13 @
Copper Bottoms.....	" .10 1/2 @
Yellow Metal.....	" .10 @
Brass, heavy.....	" .09 @

Brass, light.....	" .07 @
Composition, heavy.....	" .11 1/2 @
Lead, solid.....	" .09 1/2 @
Ten Lead.....	" .09 1/2 @
Zinc.....	" .09 1/2 @
Pewter, No. 1.....	" .09 @
Pewter, No. 2.....	" .07 @
Book Stock.....	prton. \$16.00 @
Light do.....	" 9.00 @
Stove Plate.....	" 9.00 @
Machinery do.....	" 11.00 @
Grate Bars.....	" 3.50 @

The prices current for Rags, &c., are as follows:

Canvas, Linen.....	per lb. 3 c. @ 3 1/2 c.
Cotton, No. 1.....	" 3 1/2 c. @
" No. 2.....	" 3 1/2 c. @
White, No. 1.....	" 3 1/2 c. @
" No. 2.....	" 3 1/2 c. @
Seconds.....	" 3 1/2 c. @
Sized, Woolen.....	" 2 c. @ 3 c.
Soft, do.....	" 6 1/2 c. @ 7 c.
Gunny bagging.....	" 3 c. @
Jute butts.....	" 2 1/2 c. @
Kentucky bagging.....	" 3 c. @
Book Stock.....	" 15 c. @ 16 c.
Newspaper Stock.....	" 15 c. @

Machinery Steel.....	8	10 7/8
Cast Spring Steel.....	6	6 1/2
Homogeneous Steel Plate.....	7	7 1/2

Common Horse Nails..... 13 @ 16 1/2
R. R. Spikes, 5 1/2 x 16..... 2 1/2 @ 3 1/2
Perkins' Horse shoes, 1/2 keg of 100 lbs..... 43 3/4
Mule shoes..... 10 @ 8 7/8
Putnam Horse Nails..... 10 @ 10 3/4
Globe Horse Nails..... 10 @ 10 3/4
Less list discount to the trade.

Messrs. R. C. HOFFMAN & Co., Iron and Commission Merchants, No. 23 South Frederick street, report the Pig Iron market as follows, under date of July 29: We have no change to report in the Iron market. Trade continues dull, and prices as follows:

Baltimore Charcoal Pig..... \$5.00 @ \$5.20
Virginia..... 26.00 @ 28.00
Anthracite No. 1..... 10.00 @ 20.00
" No. 2..... 10.00 @ 20.00
" No. 3..... 10.00 @ 20.00
" Mottled and White..... 13.00 @ 14.00
Charcoal, C. B. Blooms..... 50.00 @ 52.00
Billets..... 53.00 @ 55.00
Refined Blooms..... 43.00 @ 45.00

FOREIGN.

FRANCE.

(Moniteur des Interets Matériels.)

PARIS, July 14, 1878.—*Metals.*—The crops in France which at one time did not look promising, now wear a better appearance. In the manufacturing regions greater activity is observable, although in the metallurgical branch this is less observable. Meanwhile railroad earnings are improving, and taken as a whole the outlook is encouraging. *Copper.*—No favorable change can be advised. We quote here, Chili Bars, 175 francs the 100 kilos; Ingots, 175; English Tough Cake, 177.50; Best Selected, 177.50; and pure Corcoro Ore, 175. *Harve* remains firm. They quote first brands Chili Bars, 165 @ 167.50; good current ditto, 165.75; and *Lola* and *Urmenet* at 165. *Marselles* is quiet, and quotes Spanish, in slabs, 160; Red Tokat, 165; small refined Ingots, 175 @ 180; Sheathing, 192; and ditto Bolts, 197.50; Yellow Metal Sheathing, 187.50. This is supported with difficulty. We quote at Paris: Banca, 180 francs the 100 kilos; Billet, 171.50; Straits, 170; Australian, 168.75; and English at Harve and Rouen, 167.50. *Marselles* reports a dragging business. They quote Banca, 185; Straits, 170; and English Refuse, 171.50. *Billett*, 170. We quote at Paris: French, 44 francs the 100 kilos; Spanish at Harve, 43; English ditto, 43; and Belgian and German here, 44. At Harve, Spanish, first fusion, soft, is upheld at 43 @ 44. *Marselles* is steady. First Fusion, soft, at 40 @ 40.50; Second ditto, 39; Manufactured, 46. *Spelter* has become more quiet, but is nevertheless sustained. We quote at Paris, Silesian, to be delivered at Harve, 47 francs the 100 kilos; other brands at 47. *Tin.*—At Paris, 47.50; *Marselles* is unaltered; Sheet Zinc, 50 @ 50.10; *Remetted Zinc*, in slabs, 44; Adria, 43; and Malaga, 39 @ 30.50. *Iron.*—There is no particular change; the month of July, the same as its predecessor, and the market is in the midst of a great calm in this branch, only interrupted once in a while by some orders of little importance emanating from the government and our great railroad companies. Here at Paris the market is particularly quiet, and but few articles are inquired for. In the interior the dull summer season is felt pretty much everywhere. In the Champagne mixed iron closes at 190 @ 200 francs; Iron for machinery, No. 20, commands 200. In the Franche Comte the *Fraisons* forges have obtained at Rochefort the adjudication of 45 tons prime Sheet Iron at 29.50 francs the 100 kilos; *Coke* iron may be quoted 175 @ 180; Charcoal 145. In the Ardennes *Coke* iron is worth, 165 @ 170; hardware makers, and especially screw makers, complain of a lack of work, and some operatives have had to be discharged. In the Loire basin there are no fresh orders, but the larger works are still engaged in filling government orders, and thus at least a little is moving off. Messrs. Bietrix & Co. have latterly offered to furnish Common *Coke* iron at 20.75, and Common Corrugated Iron at 19.25. Mr. Fille-Bertrand, of Chambon, has received an order for Steel Bolts and Screws at 45 francs. The St. Etienne Steel works have received an order for Steel Plates for ironclads for the navy to the extent of 1450 tons at 33¢. Coal is moving off but slowly at the North, but satisfactory at the South.

BELGIUM.

(Revue Universelle.)

BRUSSELS, July 14, 1878.—*Iron.*—This week is hardly better than the preceding ones, to judge from the complaints of our makers about the low prices ruling. They certainly cannot complain of a lack of orders, which arrive with the greatest steadiness, not only for the supplying of domestic wants, but also for export. Sheet Iron, Beams and Merchant Iron are in demand, and the same may be said with respect to small articles. *Hardware* makers, Chains, Bolts and Rivets. Both the manufacturers of the larger class of material (of rolling stock, &c.) and the Steel works are not as favorably situated, for their capacity is enormous, and unless there be an extraordinary abundance of large orders they are not satisfied. On the 24th inst. the State railroads will be in the market again with an invitation for tenders for passenger and freight cars, as well as Iron tanks, and on the 27th prox. there will come off at Brussels an adjudication for work on the new railroad depot at Bruges, which will cost about 800,000 francs. *Coal.*—The Coal mines in the Liege district have lost during the past year 1,040,000 francs, whereas in 1876 they made a profit of 1,012,500 francs. During the past 47 years there have been but five years giving as bad a result as 1877.

HOLLAND.

(Koch & Vlerboom.)

ROTTERDAM, July 16, 1878.—*Tin.*—There is nothing going on here. We quote Banca, 180 guilders the 100 kilos, and Billett, 171.50. On the 12th inst. the Netherlands Trading Society announced its fourth auction sale of Tin for 1878, which will come off on the 31st inst., and consist of 10,500 slabs Banca Tin. The government is out with its monthly statistics, from which we clip the following items:

VALUE OF BANCA TIN IN HOLLAND SINCE 1869, IN GULDERS, PER 50 KILOS.

	1870	1871	1872	1873	1874	1875	1876	1877	1878
Jan. 1.	65	77	87 1/2	85 1/2	70	57 1/2	50	45	40 1/2
Feb. 1.	64 1/2	76	86	87 1/2	70	50 1/2	43 1/2	40	35 1/2
Mar. 1.	70	77 1/2	85	84	68	54	50 1/2	43 1/2	40 1/2
Apr. 1.	70 1/2	75 1/2	85	87 1/2	70	57 1/2	50 1/2	43 1/2	40 1/2
May 1.	70 1/2	75 1/2	85	84	57	50 1/2	49	42 1/2	39 1/2
June 1.	70 1/2	75 1/2	85 1/2	80	58 1/2	50 1/2	43 1/2	40 1/2	39 1/2
July 1.	70 1/2	75 1/2	84 1/2	83 1/2	60	50 1/2	40 1/2	42 1/2	39 1/2
Aug. 1.	69	70 1/2	80 1/2	79 1/2	50 1/2	48 1/2	44	41 1/2	39 1/2
Sept. 1.	70 1/2	75 1/2	80 1/2	79 1/2	50 1/2	48 1/2	44	41 1/2	39 1/2
Oct. 1.	70 1/2	75 1/2	80 1/2	79 1/2	50 1/2	48 1/2	44	41 1/2	39 1/2
Nov. 1.	70 1/2	75 1/2	80 1/2	79 1/2	50 1/2	48 1/2	44	41 1/2	39 1/2
Dec. 1.	70 1/2	75 1/2	80 1/2	79 1/2	50 1/2	48 1/2	44	41 1/2	39 1/2

EXPORT OF TIN FROM HOLLAND.

	1877	1878	1879	1880
Germany.....	522	318	283	1,002
England.....	47	21	23	153
Belgium.....	165	137	223	517
France.....	25	30	31	102
Hamburg.....	30	31	228	147
U. S. States.....	55
Other Countries.....	78	33	8	124
Total.....	848	688	662	2,003

GERMANY.

(Borsenhalles.)

HAMBURG, July 13, 1878.—*Metals.*—Rather sanguine expectations had been entertained both in England and on the Continent as regards the effect on business which the pacification of Europe would infallibly have. We do not deny the probability that business will revive in consequence of this successful termination of the congress, especially now that the crops also look promising; but it is evident that whatever improvement there may be will develop slowly, for the speculative element is still dormant. Only legitimate demand will bring about a revival, and the fall trade is as yet too far off. *Copper.*—Has been firm and weak. The tendency is downward. Berlin quotes good qualities English and Australian 69 @ 73 marks the 50 kilos, and Mansfield 72.50 @ 73. No change either here or at Stettin. *Tin.*—Our market is giving no signs of vitality, and the situation is essentially the same as a week ago. We quote Banca here 70 @ 70.25 marks the 50 kilos, and English 72 @ 75. There is no change at Stettin. *Lead* is inactive, but upheld. No change either here or at Stettin. Berlin quotes Tarnowitz, Harta and Saxonian 16.50 to 16.50 marks the 50 kilos. *Spelter.*—Hamburg is steady but quiet, Breslau

strong and Berlin unaltered. The latter quotes good classes of Silesian 18 @ 18.75 marks the 50 kilos; Hohenlohe sells to arrive at Breslau at 17. We are 18.50 with futures and spot Spelter in this city.

EAST INDIES.

(Guthrie, Wood & Co.)

SINGAPORE, June 3, 1878.—*Tin.*—The market has advanced to \$18.35 1/2 pical, at which figure sales were made early in the week. The same price has been offered and refused for the next Malacca supplies. The demand has been almost entirely for the United States and the Continent. The shipments to the United States during May have been 120 tons from here and 344 tons from Penang. *Tonnage.*—The market is dull and rates have a downward tendency. The E. Sutton for New York has hardly any cargo on board, having been kept back for the want of dead weight, which is exceedingly scarce, and there is a possibility of her being withdrawn from the berth. The Hawthorne is still unsettled. For Boston there have been no charters. *Exchange* has declined to 3 1/4 @ 3 1/2.

GALE, Ceylon, June 1, 1878.—*Plumbago.*—More favorable advice from the home market respecting Chips and Dust induced native holders to make small consignments, and some 400 barrels, principally on native terms, have thus been made to London. In absence of any actual transactions prices are quite nominal at 50 @ 55 rupees 1/2 ton; Dust, 70 @ 75 rupees for Chips, and 100 rupees for Lump. Clearances of Plumbago since May 1, 1878, all for London. *With* low stocks, and hardly any supplies on the way, prices have advanced to 45/ free on board, and we may expect a further advance shortly. The difficulty of procuring tonnage at home except at much increased rates of freight has been the cause of the present rise. *Charters.*—Business in chartering has dwindled down into complete insignificance; freights have become so low that shipmasters shrink the responsibility of accepting them, and owners waver between the alternative of working at a heavy loss or laying their ships up till things improve, the prospect of which, however, much to be desired, seems rather remote, for everywhere tonnage is abundant and cargo scarce. *Exchange* 1/9 3/4.

(Dunlop & Co.)

BATAVIA, Java, June 3, 1878.—*Metals.*—We have again to report unfavorably with regard to imports, as sales have been during the past fortnight considerably below the period last reviewed. This diminished business is undoubtedly for the greater part owing to the absence of demand; but even if dealers were more inclined to purchase, imports would probably, in view of the credit already granted to most refiners, prefer not to sell any considerable quantities on credit at present. *Iron.*—Swedish is entirely neglected, while small lots of assorted English have now and then been taken at quotations. A few cases of Dutch and English *Copper* Sheet, binder, food brands *Harve*, *Tin.*—Auction sales of *Billett* will be held during the remainder of the year in this city at about 900 picals each, as follows: On June 11, Aug. 14, Oct. 14, Dec. 9, and in 1879, on Feb. 12 and April 10. *Cargoes* commenced in the month of June, and the only transaction to note is a small sale of Scotch, to arrive, at 18 guilders, deliverable here. *Exchange.*—Rates have undergone no alteration of importance during the past fortnight, and business has not been on a large scale. We quote credits on London, 12.07 1/2 @ 12.10 guilders the pound sterling.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENGL., July 15, 1878.

THE QUARTERLY MEETINGS,

anent which such extraordinary predictions had emanated from that favored district yelet "Central England," were duly held last week, and resulted in current quotations being upheld all round and in all respects. At the Cleveland and North Staffordshire gatherings very little transpired that would interest your readers. At the Wolverhampton meeting there was a pretty good attendance, but any vain expectations that may have been entertained as to the probability of a drop in prices were speedily dispelled by the announcement of the Lilleshall Company, the Patent Shaft Company, Messrs. Barrows and Lord Dudley's agent. At Birmingham there was quite a large assemblage of ironmasters. In pig iron, sales were limited, hot-blast being retained at £4 and cold-blast at £5 for best brands. A good class of all-mine pig was, nevertheless, sold at £3. 15/, and crude pig at even less than £2 per ton, than which no lower price has ever before been reached. There are now 42 furnaces in blast in South Staffordshire out of a total of 145 erected, and there will be a further limitation presently by the blowing out of some or all of the Messrs. Whitehouse's furnaces at Tipton. Finished iron was sold on the basis of £8. 10/ for ordinary marked bars with the usual 12/6 extra for those of Lord Dudley's make. Good sheets ranged from £9 to £10; boiler plates, £10 to £10. 10/; Monmouth sheets, £9; Baldwin's Wilder Bingles, £12; Swedish charcoal iron nail rods, £14; and C B F wire rods to 4 1/2 W; £16; galvanizing sheets about £7. 15/; corrugated 20 W G about £13. 10/. At Round Oak Lord Dudley is busy on heavy rolled girders for the Admiralty.

THE SIGNING OF PEACE

at Berlin and the early conclusion of the labors of the Congress can hardly fail to have the most favorable influence on trade prospects, and in conjunction with our good harvest outlook should tend to bring out a speedy revival of business in the iron, steel and hardware branches. The only thing now wanting is that the decisions of the Conference should be peaceably and quickly carried out, so that the various peoples affected thereby may be relieved from the terrible strain they have so long suffered, and may be enabled to return to their wonted industrial pursuits. The acquisition of Cyprus by this country and the virtual protectorate of Asia Minor—whether good political "moves" or otherwise I will not here inquire—ought to prove advantageous to us from a commercial point of view, inasmuch as in both instances there is abundant room for the construction of railways, harbor works and telegraph lines, to say nothing of fortifications and the wholesale introduction of British machinery, implements, tools and general hardware. Already arrangements are being made here for the commencement of a railway in Cyprus, and there cannot be much doubt that the long-suffering Cypriotes will presently awake to all the many "blessings" of an advanced stage of civilization. Outside these particular alterations there will shortly be a resumption of trading operations throughout the whole of Southeastern Europe and Russia—a change which will be warmly welcomed by the manufacturers of this country.

THE ROYAL SHOW

at Bristol has been a great success in most

respects, the entries of machinery and implements being on an unprecedentedly large scale, over 7400 different articles in these classes being on the ground. Of traction, plowing, portable, vertical, pumping, gas and other engines there was an immense collection, a remark which is still more *apropos* to the set-out of agricultural implements and domestic machinery and labor-saving appliances. The entries of sheaf-binding machines attracted a good deal of attention. Several of those entered were American machines, either using wire or string. Walter Wood's binder, the McCormick, Osborne's, the Johnstone harvester, Howard's and Hetherington's were very closely scrutinized and criticized by the farming element present. All these contrivances are splendid examples of mechanical ingenuity, but I am still of opinion that the really practical sheaf-binder has not yet been invented. Among the implements (reapers, mowers, chaff cutters, &c.) were a number of novelties; but one of the foremost new inventions was the hedge cutter and trimmer, brought out by Hornsby's, of Grantham, and shown for the first time. The frame is on the reaper principle, but with large road wheels, and upon it is raised an iron column, from which a stout horizontal arm branches out, with the cutter bar at its extremity. This bar has the reaper cut, can be pushed or withdrawn at pleasure, and instantaneously raised or lowered to any angle and adjusted at any desired height. It is claimed that this machine will cut five miles of hedges in one day. Among the minor exhibits I noticed quite a host of handy appliances not before on public view. The sheaf-binders, I should say, will be tried next month.

SCOTCH PIG IRON

was quiet, but moderately steady in respect of price up to Thursday evening, when the annual fair holidays commenced. This vacation generally interrupts business for a week or thereabouts. There are at the present time 182,102 tons of pig in Connal's public stores, to say nothing of an at least equal quantity in makers' own yards. At this date last year there were 144,385 tons in Connal's warehouses. The total decrease in the shipments for this year is 39,467 tons. Ballast pig now sells at 42/, alongside in Forth or Clyde. There are 96 furnaces in blast in Scotland, each producing about 184 tons weekly.

Writing from Glasgow, July 12th, James Watson & Co. said: "Since the date of our last market has gradually become quieter with a restricted business doing. On Monday the price was steady at 49/9, cash, and on the following day it dropped from 49/9 to 49/7 1/2 per ton. Yesterday it was again flat at 49/7 1/2 and 49/7, cash, and to-day the price has declined to 49/6 per ton, closing buyers thereat, sellers 49/7, cash. On account of the annual holidays, business will not be resumed until Tuesday morning. Shipments last week were 7416 tons, against 11,217 tons in the corresponding week of 1877." We quote:

	No. 1.	No. 2.
G. M. B., at Glasgow.....	49/6	48/3
Coltshire,	57/3	53/
Gartherrie,	60/6	54/6
Coltshire,	55/6	50/6
Langloan,	58/	51/6
Canbroe,	50/9	49/3
Calder, at Port Dundas.....	56/6	49/
Glenarock, at Ardrossan.....	55/6	51/
Eginton,	50/6	49/6
Dalmellington,	50/6	49/6
Shotts, at Leith.....	58/	55/6
Kinnell, at Bonness.....	58/	51/

Messrs. William Colvin & Co. and John E. Swan & Bros., Limited, give coincident figures.

Included in last week's shipments from the leading ports of the Clyde were £8032 worth of machinery, mostly for Manila and Demarara, £1477 of castings; £1205 of tubes; £1868 plates for Adelaide; £1571 bars; £5276 galvanized iron; 40 tons telegraphic wire; £1500 of miscellaneous hardware. The Clyde shipbuilding yards are for the most part fairly engaged, much of the work being in steel and on government account.

THE WEST COAST WORKS

are all pretty well engaged, although Barrow is undoubtedly a head and shoulders above any of its neighbors. Mr. Smith has all his wits "on hand," and is doing a good stroke of business in rails, mostly for Canada, Ireland and Italy. Hematite pigs remain steady at the value of about £3. 2/6 @ £3. 7/6 per ton.

THE MIDDLESBORO' OFFICIAL REPORT

of the Chamber of Commerce for June gives the following interesting information: "Manufactured Iron and Steel.—The shipments from Middlesboro' during the month were altogether 15,005 tons, or 6856 tons less than in May, but 4314 tons more than in June last year. The principal colonial and foreign exports were: 3624 tons, principally rails, to Italy; 1405 tons, rails, locomotives, &c., to Australia; 719 tons, bars, hoops, and plates to Japan; 328 tons of plates to Denmark; 300 tons rails to Russia, &c. Trade has been exceedingly poor in all departments, except that of plate making, but just at the close of the month a better tone appeared, and an increased number of inquiries were received, which is hoped will result in orders. The plate makers in this district have had plenty of work to do, but they have been unable to advance their prices in face of the low rates asked by competitors. Higher quotations have been made by some firms. About 54 per cent. of the finished iron turned out in the North of England and in this immediate district is in the form of plates, chiefly for shipbuilding and boilers. Angles have been in fair request, but prices of these, as well as of all kinds of finished iron, have been kept about stationary. Ordinary bars have been selling very slowly, and there have been scarcely any inquiries for iron rails. The orders for these go principally to South Wales, where a lower price can be accepted. The Britania Iron Works have been put in operation, after a stoppage of over two and a quarter years. Messrs. Bolckow, Vaughan & Co.'s steel works at Eston have been kept in full operation, and they have proceeded rapidly with the demolition of their Middlesborough establishment in order to erect another steel manufacturing on the site. The Eston works now produce from four 8-ton Bessemer converters about 1350 tons of steel per week. The prices of steel rails are nearly as low as those of iron.

"The following are the quotations: *Finished Iron.*—Bars, common, ordinary size, £5. 10/ @ £5. 15/; do., best, £6 @ £6. 5/; do., best best, £7 @ £7. 5/; ship plates, £6. 2/6 @ £6. 7/6; boiler plates, £7. 2/6 @ £7. 7/6; angle, T, and bulb iron, £5. 12/6 @ £5. 17/6; rails (heavy), £5. 7/6 @ £5. 10/; rails (light), £5. 10/ @ £6; puddled bars, £3. 12/6 @ £3. 17/6 per ton. On wagons at works—4 months' bill, or cash less 2 1/2 %. *Fuddled bars net.* *Pig Iron.*—No. 1, £2. 2/6; No. 2, £2. 1/; No. 3, £1. 19/; No. 4 foundry, £1. 18/; No. 4 forge, £1. 18/; mottled, £1. 17/6; white, £1. 17/; refined iron, £2. 16/6. All Cleveland district G. M. B. Terms: G. M. B., cash less 1 % on Monday following delivery. *Refined iron net cash at furnaces.* Cast-iron girders, plain, £4. 12/6 @ £6; cast-iron chairs, £2. 17/6 @ £3. 5/; cast-iron pipes, 1 1/2 inch to 2 1/2 inches, £5 @ £5. 5/; 3 inches to 4 inches, £4. 10/ @ £4. 15/; 5 inches to 8 inches, £4. 9/ @ £4. 12/6; 10 inches to 16 inches, £4. 7/6 @ £4. 10/; 18 inches to 24 inches, £4. 5/ @ £5; wrought-iron girders, plain, 10/ @ 14/ per ton. *Cut Nails.*—Clasp, rose, clout, tip and sacking, per cwt., 1 1/4 inch, 18/; 7/8 inch, 16/6; 1 inch, 15/; 1 1/4 inches, 12/6; 1 1/2 to 1 3/4 inches, 11/; 2 to 2 1/2 inches, 10/; 2 1/2 to 3 inches, 9/6; 3 to 6 inches, 9/; above 6 inches, per cwt. extra, 1/1. *Joiners' brads*, per cwt., 1 inch, 17/; 1 1/4 inches, 15/6; 1 1/2 inches, 14/6; 1 3/4 to 1 1/2 inches, 13/; 2 to 2 1/2 inches, 12/; 2 1/2 to 3 inches, 11/6; 3 inches and above, 11/. *Flooring brads*, per cwt., 2 inches, 9/3; 2 1/4 inches, 9/; 2 1/2 inches and upward, 8/9. *Lath nails*, per cwt., 3/4 inch, 15/; 3/8 inch, 13/; 1 inch and above, 12/. *Colliery plate nails* of first-class scrap, warranted, per cwt., 2 to 2 1/2 inches, 11/; 2 1/2 to 3 inches, 10/6; 3 inches and upward, 10/3. *Terms.*—Cash monthly, less 5 per cent. in 30 days from date of invoice on trucks at works."

THE METAL MARKETS

have remained quiet all round since my last letter. In its weekly report the *Ironmonger* says: "*Copper* is still quiet, Chili bars of good ordinary marks being quoted at from £63. 10/ @ £63. 15/ and named brands £64; 125 tons were sold at £64. 2/6 @ £64. 5/; 3 months, prompt. The other quotations are: Wallaroo, £73. 10/ @ £73. 15/; Burra, £71; English tough, £69 @ £71; best selected, £70. 10/ @ £71. 10/; and strong sheets, £74 @ £75. Australian remains unchanged. *Tin* continues steady, a moderate business having been done in Straits and Australian at £61. 5/ @ £61. 10/; English ingots, £65. *Tin Plates* have been in fair request, the restrictive movement having produced a fairly good indirect result. The prices of charcoal plates have been very well sustained. *Lead* has experienced no material change, business having been done in soft Spanish, without silver, at £16. 15/. *Spelter* is quoted at from £17. 17/ @ £18. *Quicksilver* at £7 1/2 flask, and *Antimony*, £49 @ £49. 10/. The *Zinc* fortnightly sale was held on Tuesday by W. T. Sargent & Son, when 180 tons were sold as follows: 175 tons at £20. 15/; 5 tons, £20. 17/6. The official report of the London Exchange is: "*Copper.*—Quiet; G. O. B. Chili bars, £62. 15/; spot; Wallaroo, £73. 10/ @ £73. 15/; Burra, £71; tough, £68 @ £69; best selected, £69. 10/ @ £71; strong sheets, £74 @ £75. *Tin.* The Dutch Trading Co. announced for July 31 a public sale of about 10,000 slabs of Banca. The market is quiet at £61. 10/ for Straits and Australian; English ingots, £65. *Iron.*—Scotch pigs market closed. *Lead.*—English pig, £17 @ £17. 2/6; soft Spanish, without silver, £16. 15/. *Spelter.*—Steady; £18. 2/6 @ £18. 5/. *Quicksilver*, £7. *Antimony*, £49 @ £49. 10/."

FROM SHEFFIELD

I have this week little news of importance, save that in several of the local trades there is rather more work in hand. At John Brown & Co.'s works, for instance, the men in the armor-plate department have once more been put on full time, after 2 1/2 years of "short commons," and additional men have even been set on. This is a good sign, inasmuch as the larger houses generally feel any spurt the earliest. The steel manufacturers are tolerably active, and in cutlery generally the turnover is more cheerful. Various Admiralty orders have lately been given out.

BIRMINGHAM AND SOUTH STAFFORDSHIRE,

as regards the iron trade, are as fully alluded to in a preceding paragraph as the necessities of the case appear to warrant. As regards their chief hardware industries rather better accounts are forthcoming, and it is felt that every branch of business is certain to benefit by the advent of peace. From France, India, the colonies and South America good commissions for tools and general hardware have come in, and the unwonted peacefulness of Cuba is bringing in capital incidents thence. The screw manufacturers here, as with you, are vastly overstocked, one house alone having 2,000,000 gross on hand.

SOUTH WALES AND MONMOUTHSHIRE

are not over busy, although the gradual adoption of steel manufacturing plant is bringing in its wake some little business. Downlais and Ebbw Vale, indeed, are what one may term tolerably active. From Cardiff last week 1131 tons of iron were exported, including 500 tons to Hamburg and 350 tons to Gothenburg, both from Downlais; 20 tons to Gothenburg from Rhymney and 166 tons of sheets to Amsterdam. From Newport 1899 tons of railway iron were shipped, including 862 tons to Calcutta on government account. Into this port 3460 tons of iron ore were imported. In and near Swansea the tin-plate works remain pretty well engaged, although there is no pressure whatever. Prices are firm, especially for reputable charcoal plates.

THE BOARD OF TRADE RETURNS

for June, briefly summarized show that our exports were of the value of £15,091,638, as against £15,305,659 in the same month of 1877, and £15,848,260 in June, 1876. The total value of the iron and steel foreign shipments amounted last month to £1,728,426, as compared with £1,872,345 in June, 1877, and £1,

INDUSTRIAL ITEMS.

NEW HAMPSHIRE.

Critchley & Whalley, of Portsmouth, manufacturing machinists, make a specialty of Critchley's Patent Expanding Reamer, and have been very busy for the past year. Their exports of this tool have been large, and are increasing.

MASSACHUSETTS.

George Dwight, Jr., & Co., of Springfield, have been awarded the contract for the corrugated iron arches and the lath work for the new custom house at Chicago, Ill., the contract amounting to \$100,000 or \$125,000.

An agent of the Hampden Watch Company, of Springfield, has gone to Europe to arrange for the further introduction of their watches in France and England. A large house in Paris and another in London talk of taking hold.

The Adams Nickel Plating Company, of South Windham, have closed business and the property is offered for sale.

At the annual meeting of the stockholders of the American Steam Gauge Company, the following officers were elected for the ensuing year: President, J. C. Blaisdell; Treasurer, E. B. Phillips; Clerk, W. H. Warnock; Directors, J. C. Blaisdell, E. B. Phillips, H. E. Mowry, H. K. Moore, and B. L. Burt. A dividend of six per cent. was declared.

The Fall River Spool and Bobbin Mill Company have received its incorporation charter. It has been running about three years as a private concern.

The Lowell Machine Shop are having large orders for Southern work, and are employing about 625 hands, with prospects very favorable for a good fall business.

Gardner, Chilson & Co.'s iron foundry, at Mansfield, has started up, giving employment to some 60 men.

CONNECTICUT.

The Haydensville Brass Works are closed for a week or two, preparatory to the new management, of which Joel Hayden is the head, taking possession. It is understood that the old concern will pay about 25 cents on the dollar.

The new iron bridge over the Connecticut Western Road at Satan's Kingdom is completed, and was tested last week by Superintendent Jones. The bridge has a clear span of 205 feet and is 25 feet high, and was tested with four locomotives, equal to a load of 220 tons. It was built by the Niagara Bridge Company of Buffalo, N. Y., and gives complete satisfaction. The bridge is calculated to stand six times the weight given it in the test, but in the ordinary running of trains it could not be weighted to more than half the amount of the test.

The English steamer J. B. Walker sailed on the 25th ult. from New Haven with arms and ammunition for the Turkish government.

New arrangements have been made for working the Cheshire copper mines, and \$75,000 will be spent in the equipment. The ore is said to be very rich, and the enthusiastic superintendent says that the time will come when 50,000 miners will be at work on the hills in the vicinity.

Since the reorganization of the Billings & Spencer Company, of Hartford, business in their line of specialties has steadily increased, until at the present time they are employing 50 hands in their shop, and running full time.

It would be hard to find in any workshop or factory in the country a greater variety of forgings than are turned out at this establishment, including packer ratchet drills, lathe dogs, screw plates and dies, adjustable screw wrenches, Barwick wrenches, screw drivers, Billings patent solid forged steel sewing machine shuttles, bobbins, patent animal hair clippers, &c., on to the end of the chapter. This company are quite busy on foreign orders, and are now manufacturing forgings for shuttle blanks to go to England. Their shop is filled with the latest and most improved machinery and appliances for prosecuting this large business, and all their goods, made under the direction and management of the efficient president, Mr. Chas. E. Billings, are first-class and warranted.—*Commercial Bulletin*.

NEW YORK.

Work at the Rensselaer works and Bessemer steel works, Troy, was substantially resumed on Tuesday, the 23d ult., after a suspension of about three weeks, but it will take several days before all the departments in the several mills are in complete running order, as much of the machinery is new. The alterations at the steel works consist chiefly in replacing the old and worn-out machinery with new, improvements being made in the former patterns wherever possible. At the Rensselaer works the principal change is the addition of a new rail-straightener, by means of which the services of from four to six men can be dispensed with if it works satisfactorily. The total cost of all the improvements has been about \$20,000, and the works are now in condition to run all winter without stopping, unless some unforeseen accident occurs. There are orders enough on hand at present to keep all the mills in operation for several months to come.

The Albany foundry is to be consolidated with the Coxackie Malleable and Gray Iron Company at Coxackie, to save running expenses.

Syracuse proposes to add a cutlery factory to its many industrial enterprises.

Messrs. Burden & Son of Troy have sold more horse shoes thus far this year than ever before during the same period of time.

NEW JERSEY.

The Taylor Iron Works, at High Bridge, have received a considerable order for cast-iron chilled car wheels, to be shipped to South America. Their trade with the southern continent is increasing.

New Jersey takes the lead in the States in the manufacture of window-glass. It has 34 factories. Pennsylvania has 30; New York 11; Massachusetts, Illinois and Maryland, each 5; West Virginia and Missouri, each 2; Indiana 3, and Michigan, Wisconsin and Ohio one each.

PENNSYLVANIA.

We clip the following from the *Sharon Herald* of the 26th ult.: In Sharon, for the

week ending Saturday, 20th inst., the Kimberly mill resumed operations on Wednesday, with the puddle, nail plate mill and nail factory on. One furnace kept on in the bar mill for the remainder of the week and the guide mill made double turn. Keel Ridge Furnace is still in blast, receiving limestone and coke, but no ore; there is enough of that on the ground to keep running two months longer. At the Western Iron Co.'s works, puddle and guide mills double turn; hoop, bar and sheet mills single turn; nail plate mill, nail factory and chain factory still off. No. 2 Blast Furnace doing well. No. 1 all cleaned out. This was one of the cleanest blow-outs we have seen for some time. As far as a sough was concerned there was none of it, the coke and burned-out stock running down on the bottom stones. The whole thing was cleaned out last week with only a small force of men. It was a very successful blast and an equally successful blow-out.

The Thomas Iron Co. have blown out another of their furnaces, leaving but four of their eight in blast.

Work on the large cotton press at Scott Foundry, Reading, has been prosecuted day and night, and some of the pieces will be finished next week and shipped. A large number of hands have been employed at this foundry for some time, and the place presents a busy scene. Besides the big press, other large machinery, such as steam shears for cutting iron, are being made.

The contract for the enlargement of the rolling mill of Messrs. E. & G. Brooke at Birdsboro' has been awarded to Levi H. Focht. The new mill will probably occupy a site along the present mill race.

The firm of Carr, Croley & Devlin, malleable iron workers, Philadelphia, have notified their employees that they intend reducing their wages. This will be the third reduction since 1876.

The six furnaces in the puddling mill of the Chesapeake Nail Works at Harrisburg, which have been idle since the explosion, have been put into operation. The mill has been repaired with the exception of one of the wings—the one in which the explosion occurred. The puddlers have been ordered to work four turns, three heats to a turn, until the destroyed portion is rebuilt. The nail factory, which has been idle for two days, resumed operations on Wednesday of last week.

Taylor & Henderson of Dunbar have rented the coke works of Lake & Co. at Scottdale. There are 50 ovens, for which the lessees pay \$15 a day.

The Phoenix Iron Co. of Phoenixville pay a mercantile tax of \$1700.

All the iron works in New Castle are idle.

The Warwick Iron Co. at Pottstown are about erecting an iron roof over the cinder crane at their furnace. It will cost nearly \$600. The work will be done by the Phoenix Iron Co. of Phoenixville.

Among a lot of scrap iron purchased at Bechtelsville, this county, for the Pottstown foundry was a stove plate that seems to be of great antiquity, bearing representations of a man and woman fighting, and also two cats and two dogs similarly engaged. Over these scenes of conflict is inscribed a verse from the Bible, in German, calling for peace. The plate will be preserved as a relic.—*Reading Times*.

An item published in our last issue calls for correction as follows: The capacity of the wire mill of the Gautier Steel Works, Johnstown, is to be increased from 30 tons to 60 tons per day. The company have had built at Alliance, Ohio, machinery for the manufacture of a ton of horse shoes of the "Williams" pattern every hour.

PITTSBURGH AND VICINITY.

Lewis, Oliver & Phillips are now engaged on an order for 62 kegs of carriage bolts for Australia.

Plunkett, Ihmsen & Co. started their glass factory, on Thirteenth street, South Side, last Monday, employing about 125 men and boys.

The puddling department of Carnegie Bros. & Co.'s mill has suspended operations. For more than a year past the department has been running double turn, but the firm have accumulated a sufficient stock of muck bar to allow a suspension of a week or two during the heated season. During the interim stock will be taken. The firm employ 57 puddlers, exclusive of the extra men needed during the heated term.

One Wednesday evening of last week an accident occurred at the hoop mill of J. Painter & Sons, on the South Side, which will involve the firm in heavy loss. While the machinery was in motion and work going on the belt slipped off the governor and the engines at once started at tremendous speed. There was no one near the throttle, and the first instinct of all in the mill was to get out of the building. Scarcely had all escaped when the fly-wheel burst, and the fragments flying about in all directions tore out the supports, and the mill fell in a mass of ruins. It was an iron-clad building, 50 x 100 feet. It is not as yet known what damage has been done to the machinery.

Messrs. Kier Bros., Pittsburgh, manufacturers of the celebrated "Salina" fire-brick, are running their works to their utmost capacity, with a great many orders ahead. The firm have been very successful in satisfying the trade with their 9-inch and other shapes of brick for use where there is intense heat and great friction.

WEST VIRGINIA.

The "Pittsburgh Coal and Dock Company," has been incorporated by the State of West Virginia. There has been subscribed and paid in a capital stock of \$500, with privilege of increasing from time to time to \$500,000. The company is organized for the purpose of buying and leasing coal lands, mining and shipping coal, &c., and erecting all the necessary tracks, tipples, &c. Coal land in West Virginia along the Panhandle Road, opposite Steubenville, has been purchased by the company, whose chief office will be at the Wheeling Junction. Shipments of coal by river will be made from this point.

VIRGINIA.

Capt. J. E. Johnson, manager of the Longdale Furnace, has been spending a few days in Cincinnati and reports the furnace

working satisfactorily. They have a large established trade for their iron. Mr. Johnson thinks the next change in price of this iron will be upward. The furnace is expected to run steadily.

GEORGIA.

The Cherokee Furnace has met with further delay in starting again on cold-blast iron, but is expected to start up soon. The company have a number of orders for car wheel grades, booked in advance. They have a fair stock of their hot-blast iron on hand, which is a favorite for work requiring especially choice iron.

OHIO.

The Enterprise Co-operative Glass Company at Ravenna, composed of Southsiders, had been turning out a bad quality of glass, and were at a loss to discover the cause, but on tearing down their pots the secret was developed. The material of which they were constructed was found to contain nails and other particles of iron, which melted and mingled with the glass, thus injuring its quality.

The Hubbard Rolling Mill shut down on Wednesday, the 24th ult., owing to some difference between the proprietors and employees.

It is said that a rolling mill will be established at Salem if the citizens contribute enough money.

The Steubenville Glass Works, A. J. Beatty & Sons, were established in 1854. In 1858 they commenced the manufacture of flint glass tumblers and jelly glasses exclusively, and have continued it up to the present time. There are in the factory two 10-pot furnaces, giving employment to 150 men.

The Belfont Iron Works, Ironton, held their election for directors on Wednesday, the 24th ult. The old board, consisting of F. D. Norton, L. T. Dean, Geo. Willard, John G. Peebles, B. H. Burr, J. H. Bothwell and J. B. Hastings were re-elected.

The Diamond Glass Company, Ravenna, makers of window glass, are shut down, as is usual at this season. They are erecting a new furnace and will start up Sept. 1 with 50 men. Sales have been larger during the year just ended than they were the previous year.

Loomis & Nyman, of Tiffin, are shipping a great many of their celebrated "Tiffin" well-boring and rock-drilling machines. Orders from Michigan, Kansas, Nebraska, Texas and the far West are rapidly coming in.

The manufacture of Butman's patent furnace grates and doors, hitherto carried on at Dayton by T. R. Butman, Higbee & Co., has been discontinued at that point. A new firm has been formed at Bellevue, consisting of T. R. Butman, Higbee & Co., and T. L. Brannan & Co., who will manufacture the above articles under the name of the Butman Furnace Company.

E. & R. Knapp, Ravenna, made 2000 of their wood well and cistern pumps last year. They have been established three years, and have shipped to Pennsylvania, Ohio and throughout the West.

The Morse Bridge Works, Youngstown, have shipped their fifth bridge since commencing operations in May.

Messrs. Chas. C. Winchell & Co., agents for the purchase and sale of new and second-hand machinery, have their office and warehouse at No. 88 East Second street, Cincinnati, where they receive machinery on consignment and purchase for parties at a distance.

Messrs. Thos. S. Brown & Co., iron merchants, Cincinnati, have removed their place of business from No. 36 Fourth street to No. 76 West Front street. Mr. B. F. Paddock having retired from the above firm continues business at the old place.

Messrs. Wm. Kirkup & Sons, manufacturers of brass goods, steam and water gauges, pipe fittings, heating apparatus, &c., at Cincinnati, are making the largest steam gauge that has ever been made in this part of the country; its diameter is 24 inches, and it is for one of the large steamers plying the Ohio River from Cincinnati. Mr. Kirkup is one of the oldest citizens of Cincinnati, and has been engaged in his present line of business for over 31 years, and has gradually built up a large business.

Messrs. Robert Jones & Co., boiler makers, of Cincinnati, are turning out some large and fine steam boilers to fill orders, among which are four large boilers for New Orleans and six very fine ones for the Centralia Iron and Nail Works in Illinois, besides 14 stacks and large lot of steel and iron work for the mill. Messrs. Jones & Co. are one of the leading boiler making establishments of Cincinnati, and have a fair share of the work done in that city.

Mr. Thomas S. Smith has recommenced his old business at No. 139 East Pearl street, Cincinnati, where he does all kinds of iron and steel perforating, and manufactures coal and ore screens, smut machine plates and concaves, bolts, nuts and washers, cotton ties, window guards and various other goods, including iron fencing, fire-boxes, &c.

Mr. J. E. Hull, superintendent P. S. & W. Co.'s Cincinnati factory, having removed to the large building at 137 Pearl street, Cincinnati, is making all kinds of tinners' tools, galvanized iron cornice makers' tools, squaring shears, &c. He also keeps in stock a full assortment of tinners' machines, circular shears, &c. He has put in some new machinery and much increased the capacity of the works.

ILLINOIS.

The Chicago Malleable Iron Works have been running constantly for the year past with a full force, and at no time have they been up with their orders, so great has been the demand for their castings and specialties. The Ewart Detachable Drive Chain is manufactured solely by the Chicago Malleable Iron Co.

The reaper works of C. H. & L. J. McCormick, Chicago, are unusually busy this season, running to their full capacity, and are behind their orders. Their foreign trade is steadily increasing and bids fair to grow to immense proportions. Between April and July of this year they received three orders from New Zealand for about \$50,000 worth of machines.

Mason & Davis, of the Lake Shore Foundry, Chicago, have been compelled to double the size of their molding room and make other additions to their works to enable

them to keep up with the increasing demand for their small castings and other specialties. Their molding room is now 50 x 50 feet; working and store room, 50 x 25, two stories high. They make a specialty of light and fancy castings.

The Elgin Watch Factory is at present running steadily with a force of about 750 hands, and turning out from 300 to 350 finished watches per day.

The Springfield Iron Co. of Springfield are making preparations to build an additional mill building. The company have recently been making a quantity of 62-pound rails for the Wabash road.

WISCONSIN.

E. P. Allis & Co., Milwaukee, are so crowded with work that they require the services of 15 more machinists.

The Cream City Iron Works Co. of Milwaukee have just shipped four cockle separating machines of their manufacture to Liverpool, England.

The Cream City Iron Works, Filer, Stowell & Co., Milwaukee, received by one morning's mail orders for ten cockle separators. One was from Glasgow, two from Liverpool, one from Minnesota and six from various parts of Wisconsin. They think this a very good day's business for a dull month of midsummer.

A New Steam Road Wagon.

The Madison (Wis.) *State Journal* says: A year or two since the Legislature offered a prize of \$10,000 for a perfect steam wagon for general agricultural and hauling purposes, to be able to stand such tests as a board of three commissioners should propose. Among other things, the contesting machines were to make a 200-mile trip along the country roads of the State, due north and south, haul a heavy wagon behind them, be able to plow, run threshing machines and perform other feats such as the ingenuity or wisdom of the commissioners might suggest. The commissioners appointed by the Governor were Messrs. Olin, of Jefferson; Smith, of Green Bay; and Marshall, of Adams county.

On the 15th inst. the commissioners, after giving due notice, met in Green Bay. The only machines entered were the "Oshkosh," owned by Schomer & Farrand, of Oshkosh, and the "Green Bay," owned by the Cowles Brothers, of East Green Bay. Other machines, from Madison and Milwaukee, had notified the board of their desire to enter, but did not appear on the ground at the advertised time.

The start was made from Fort Howard at noon of the 16th inst. When the "Green Bay" had emerged from the city limits it broke down, and was sent back to the shop for repairs. The "Oshkosh" kept on its way, reaching Appleton, a distance of 32 miles, at 8 p. m. Leaving Appleton at 9.30 the following morning, Neenah was reached in time for dinner, and the people of this little "Flower of the Fox" were treated to an exhibition of speed on the principal streets of the city. From Neenah to Oshkosh is about 14 miles, and the machine made the trip in two hours—from 1 to 3 p. m.

At Oshkosh the Green Bay machine was found. It had made good time on a flat car over the Chicago and Northwestern Railway, and beat the Second City invention by several hours. It was cruel on the Green Bay engine, but the commissioners, who had followed the "Oshkosh" in buggies, demanded that the former, though feeble, be taken from the cars. The "boys" were then summoned by a plentiful blowing of whistles, and each machine being hitched to about five tons of green lumber in a road wagon, the Oshkoshians were amused by seeing them cavort around through the sawdust streets.

A trial of speed was next in order, and as the average citizen of Oshkosh will get out of a dentist's chair to see anything that is fast, there was a goodly crowd at the race course. Here the superiority of the home production was evident. The Green Bay was speedy, but it couldn't run a mile without stopping, and the Oshkosh wagon shut it out in two straight heats, in 4.36 and 4.41, without turning a hair. Considering the condition of the track and the extreme heat, this was good time for a green machine which has not been trained.

The machine left Oshkosh at 7 p. m. on Saturday last, en route for Waupun. The Green Bay machine broke down two miles out of town and returned to Oshkosh for repairs, spending Sunday in a machine shop by way of rest. "Oshkosh" continued the 34-mile trip to Waupun, making it in 6 hours and 25 minutes. From Waupun to Watertown the 32 miles over the sand hills was made in 4 hours and 30 seconds. From Watertown to Fort Atkinson is 21 miles, this distance being accomplished in 2 hours and 10 minutes.

At Fort Atkinson a plowing trial was had on Snell's farm. A gang of two plows was furnished, and the Oshkosh turned over a goodly portion of a 60-acre field. A crowd of 500 people were present to witness the novel sight. The time from Fort Atkinson to Milton Junction (13 miles) was 2 hours and 15 minutes; from Milton Junction to Janesville (8 miles), 1 hour and 2 minutes; from Janesville to Madison (40 miles), 7 hours and 30 minutes.

The Oshkosh, in charge of Messrs. Frank Schomer and Ans. Farrand, the inventors, as assistants, together with two boys, and accompanied by Commissioner Olin, arrived in this city last evening, having made the trip from Fort Howard—201 miles—in 33 hours and 27 seconds, official time; the time allowance given by law—five miles an hour—was 40 hours; the Oshkosh, therefore, beat the official time 6 hours and 33 minutes.

This machine has throughout hauled a wagon weighing 3500 pounds. The weight of the machine alone is 4800 pounds, and with water and coal for 8 miles, 6600 pounds. It is a handsome affair, neatly and simply made, and appears calculated to do any amount of work. The engineers report no breakages on the trip, no runaways from scared teams and not a bridge plank disturbed; while most of the roadway has been hard to travel, being heavy sand and gravel. The fastest time made by it was between Johnson's Creek

and Fort Atkinson—57 miles in 11 hours and 30 minutes.

The Green Bay took the road from Oshkosh last Monday, accompanied most of the way by Commissioners Smith and Marshall. They arrived this morning, reporting it in the ditch at Jefferson. It will be given a dose of physic and again started on its luckless way.

It is understood that the commissioners have numerous other tests to suggest before finally awarding the prize, even if they consider the Oshkosh machine to merit it. The Oshkosh cavorted around the streets this afternoon and was visited during the day at its stable in the Park Hotel yard by hundreds of the curious minded. It will remain here several days.

Tin Plate and Janned Ware.

The *Ironmonger* says: Apart from season requisites, such as baths, toilet sets and traveling boxes, and government contracts for mess tins, there is no great animation yet in this branch, either for home or export. Country ironmongers order very sparingly, their stocks in some cases being considerable, and the watering places of North Wales and the English West Coast are all more or less adversely affected by the Lancashire strike, which threatens them with an exceptionally bad season. The consequence is very keen competition and low prices, to meet which local manufacturers are bringing out goods of a specially slight and cheap make, such as 20-inch Scarborough trunks of 26-gauge iron at 7/ with discount. The articles are wonderfully good—for the money, but it may be questioned whether reputation is served or trade permanently benefited by conceding so much to the craving for cheapness; more especially now that a general reaction is setting in against cheap goods as being the dearest in the long run. In the tinware, as in other branches, those firms appear to suffer least from the depression of trade who have steadfastly resisted the endeavors of merchants and factors to beat them down in price and quality. There can be no doubt, at all events, that our manufacturers have lost ground in Australia through their weak complaisance in this respect, and it will take both time and trouble to win back from the Americans the trade sacrificed through this folly. There are some indications, however, that the tide of colonial favor is on the turn, and that the prejudice against English-made goods, so skillfully and assiduously fostered by the American travelers, is beginning to wane. Some three or four of the leading local manufacturers of hollow-ware, metallic bedsteads and tin-plate ware lately united to send out a special commission to Australia to investigate the extent and causes of the diversion of favor from English to American goods, and the result is more encouraging than had been anticipated. For certain classes and qualities of edge tools the Americans have certainly got a firm hold of the market, but in other lines, and especially tinware, English goods of the better class fairly hold their own, and need only good representation to compete successfully with American ware, more especially where hand labor is involved. Firms doing a French trade are rather busy just now in preparing janned ornamental coal vases for the Paris market, where those goods are in growing request.

Anthracite Coal Product of 1877.—The total quantity of anthracite coal mined in Pennsylvania in 1877, including that used in and about the mines by engines and laborers, is stated in the report of the mine inspectors to be 22,816,359 tons. The products of the respective districts are as follows:

South District of Luzerne and Carbon Tons.	
counties.....	4,070,015
Middle District of Luzerne county.....	4,080,327
Eastern.....	4,808,208
Second or Shenandoah District.....	4,805,467
Third or Shamokin District.....	3,471,562
First or Pottsville District.....	1,580,780

The number of persons employed in and about the mines was 66,842, and the number of fatal accidents that occurred last year was 194. The quantity of coal produced per life lost was largest in the South district of Luzerne and Carbon counties, viz., 156,539 tons, and smallest in the First or Pottsville district, where the quantity of coal produced per life lost was 54,510 tons.

In a lecture recently delivered by Dr. Siemens on the utilization of heat and other natural forces, some very suggestive facts were stated. He showed, among other things, how heat can be made to do a greater amount of work than ever by means of electricity. One hundred horse-power of steam or water may be used, for instance, at a central or convenient place to drive dynamo-electric machines. The current there produced could, by pipes, be conducted to halls or factories and then converted into light or mechanical power. If light were required, the equivalent to 125,000 candles would be given at an expenditure of three and three-fourths hundredweights of coal instead of three and three-fourths tons. The amount of force which is lost to man from not utilizing the Falls of Niagara is enormous. Every hour 100,000,000 tons of water descend; there a height of 150 feet is equal to 16,800,000 horse-power. To pump that water back, estimating the consumption of coal at four pounds per horse-power per hour, would require 266,000,000 tons of coal a year, or a quantity equal to the total coal consumption of the world. Evidently the best means of employing the available forces for work have not yet been put into use, and the neglect of wind, water and tide power is surprising when the whole subject is considered.

The Danish government has published a small book of statistics. The total population of the kingdom exceeds 2,000,000, of whom 1,959,000 live in Denmark proper, 72,000 in Iceland, 9800 in Greenland and 37,000 in the West Indian colonies. The population of Copenhagen and its suburbs is about 250,000. The average duration of life in Denmark is fifty years, while in England it is forty-five, in France thirty-two and in Italy only thirty; but the number of suicides is very large and increases every year, the majority being by hanging.

THE LANGDON MITRE BOX COMPANY,

Millers

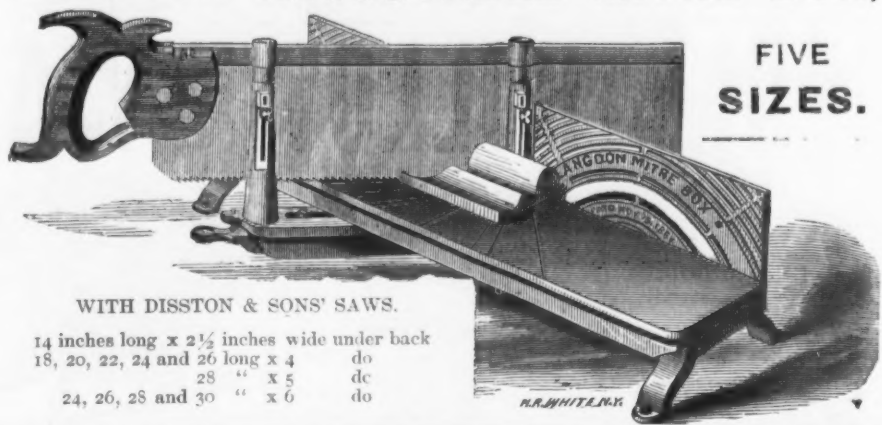
Falls, Mass.,



Sole Owners and Manufacturers of the

LANGDON ADJUSTABLE MITRE BOX,

FIVE SIZES.



WITH DISSTON & SONS' SAWS.

14 inches long x 2 1/2 inches wide under back
18, 20, 22, 24 and 26 long x 4 do
28 " x 5 do
24, 26, 28 and 30 " x 6 do

Dealers wishing to advertise furnished with electrotypes without cost.

All parts of each size made to interchange. Illustrated circulars (issue 1877) sent when desired.

L. COES'

Genuine Improved Patent

SCREW WRENCHES.

Manufactured by

L. COES & CO.,
Worcester, Mass.



We invite the particular attention of the trade to our New Straight Bar Wrench, *revised*, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to any strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the fact, that in 1869 we made several important improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were at once closely imitated and sold as the *Genuine Wrench* by certain parties who seem to rely upon our improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be good evidence that we manufacture a superior Wrench, we wish the trade may not be deceived on the question of originality. Trusting the trade will fully appreciate our recent efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped!

"L. COES & CO."

Warehouse, 97 Chambers St., & 81 Reade St., N. Y.
HORACE DURRIE & CO., Sole Agents.

EXCELSIOR WRINGERS



The only Wringers that conduct the water into either tub, without being changed from one tub to the other.

They wring from either tub into the other, right or left, with equal facility. Warranted to work as represented.

FOR STATIONARY TUBS.

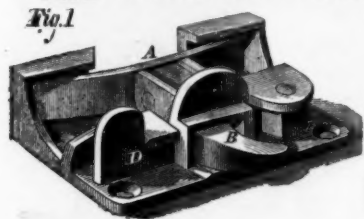
They are made for use on square tubs, such as are principally used in cities, and are the only Wringers especially adapted for that purpose. Send for an illustrated price list to the manufacturers,

BAILEY WRINGING MACHINE CO.,
No. 99 Chambers Street, New York.

ALSO MANUFACTURERS' AGENTS FOR

Defiance Metallic Planes, Simpson's Adjustable Vises, American Meat Choppers, Silver's Stuffers and Presses, Domestic Ironing Mangles.
SPECIAL QUOTATIONS ON THE ABOVE GOODS FOR EXPORT.

THE PERFECT SASH TIGHTENER AND LOCK.



Manufactured entirely from Malleable Iron, Burglar Proof, Anti-Rattling, Draws Sash to Exact Center. No Springs to Get out of Order.

The Best in the Market.

METALLIC CLOTHES PIN,

For either Wire or Rope Line,

Will securely hold any article, from a silk handkerchief to a carpet. No article can be blown away. Does not soil the clothing. Manufactured by

CLARK & SMITH, Patentees, Chester, Orange Co., N. Y.

J. I. BROWER & SON,
286 Greenwich St., New York.

Who keep a general assortment on hand for the country trade. *Jewett's Horse Ramps*, 14, 15 and 16 inch, *Maharaj's \$10 Tire Shrinker*, *Heller's Ramps*. Send for Circular.
SPECIAL DISCOUNTS TO JOBBERS.

MUZZLES! MUZZLES! MUZZLES!

E. OLIVER,

106 and 108 Beekman St., New York,

Manufacturer of

Dog Muzzles, Wire Cloth and Netting, Moulder Riddles, Decoy Rat and Mouse Traps, Wire Dish Covers, Flour and Meal Sieves, &c., &c.,
At the Lowest Prices.

IRON AND STEEL DROP FORGINGS

All shapes, small and large, including Gun, Pistol, Wrench Bars, &c. Also, Die Sinking. Manufacturers also of Bricklayers', Moulders' and Plasterers' Tools, Saddlers' Round and Head Knives.

WILLIAM ROSE & BROS.,

36th & Filbert Sts., West Philadelphia.

G. W. Bradley's Edge Tools.

Butchers' Cleavers, Butchers' Choppers, Axes and Hatchets, Grub Hoe and Mattocks, Mill Picks, Box Chisels and Scrapers

Ring Bush Hooks, Axe Eye Bush Hooks, Socket Bush Hooks, Watt's Ship Carpenters' Tools, Carpenters' Draw/Knives, Coopers' and Turpentine Tools.

FOR SALE BY

MARTIN DOSCHER, Agent, 96 Chambers Street, N. Y.

NATIONAL Horse Nail Co.

MANUFACTURERS OF

FINISHED

[BRIGHT OR BLUED]



These nails are made of the best brands of **NORWAY IRON**, and are guaranteed to be equal to any in the market.

NATIONAL HORSE NAIL CO.,

VERGENNES, VT.

HORACE DURRIE & CO., Agents,
No. 97 Chambers St., New York

CHAS. E. LITTLE, 59 Fulton St., N. Y.

1760.

Solid Cast Steel Pump Auger

Solid Cast Steel Augers & Reamers

For Boring PUMP LOGS. All sizes in stock. Socket Shanks, Ring Handles, and Connecting Rods for the above to order. Also Tensioning Tools for joining log ends. Coopers' and Slaters' Tools, Tool Chests. Tools for all trades a specialty.

PUTNAM'S

HOT FORGED & HAMMER POINTED
Horse Shoe Nails.



TRADE MARK.

Made from the best of Norway Iron.

The only hot forged machine made Horse Shoe Nail in the world that is *not sheared or cut* on the point. Warranted never to split or silver in the driving, and to hold the shoe longer than any other Nail. For sale by the hardware and iron trade generally.

PUTNAM NAIL CO.,

P. O. Address, Naposet, Mass.

BOSTON

PATENT CONVEX

Fluting & Smoothing Iron.



1st. It can be used as an ordinary Smoothing Iron. 2d. It is a Fluting Machine as well as a Smoothing Iron. 3d. The Fluting Attachment being made of brass, and convex in form, it has all the advantages of the crank machine. 4th. It combines the two articles in one, taking up the room of but one machine, and is always ready for use.

A. A. WEEKS, Manufacturer,

No. 82 John Street, New York.

TACKLE BLOCKS

BURR & CO.,

Manufacturers of Waterman and Russell's

Patent Iron Strapped Blocks.

Also, Manufacturers of

ROPE STRAPPED BLOCKS.

31 Peck Slip, New York.



HORACE DURRIE & CO.,
Agents, - - - New York.



ESTABLISHED 1850.

WM. HASSALL,

Manufacturer of

American and French

Wire Nails

With Flat, Round, Oval, Depressed, Screw and Fancy Heads.

Molding and Finishing Nails, with or without heads. *Brush Makers', Upholsterers', Cigar Box, Basket, Chair and Undertakers' Finishing Nails* a specialty. *Shoe Nails of Brass and Iron. Bright Iron Rivets. Brass and Iron Escutcheon Pins*, with flat, round and fancy heads, all sizes on hand and to order.

OFFICE AND WORKS: Nos. 63 & 65 Elizabeth Street, New York.

CHAMPION HOG RINGER RINGS and HOLDER.

Only double Ring ever invented. The only Ring that will effectively keep Hogs from rooting. No sharp points in the nose.

Ringers, 75c. Rings, 50c. 100. Holders, 75c. Huskers, 15c.

CHAMBERS BERING & QUINLAN, Exclusive Manufacturers Decatur, Ill.



BROWN'S HOG AND PIG RINGER and RINGS.

Only single Ring in the market that closes on the outside of the nose. No sharp points in the nose to keep it sore.

THE POCASSET IRON WORKS,

Successors to BLACKWELL & BURR.

Established 1824.

FOUNDRY at Pocasset Mass., U. S. A.

OFFICE AND WAREHOUSE, 7 & 9 Cliff Street, New York.

The Largest Manufacturers in the United States of

SOUTHERN HOLLOW WARE.



Sugar Pan.



New Pattern Wash Kettle.



Pot.



Cauldron Kettle.



Deep Oven and Lid.

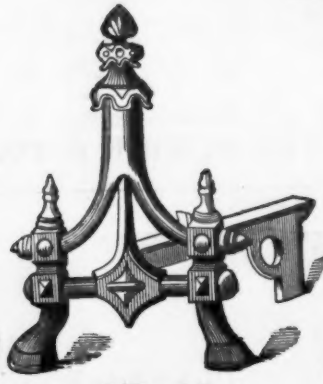


Deep Spider and Lid.

FIRE DOGS.



"Brass Top."



"Home."



"Diamond."



"Lone Star."



"Fancy."



"Ring Top."



"Pine State."



"Texas."

STERLING & HERRICK,

NOS. 7 AND 9 CLIFF STREET, NEW YORK.

Sole Agents for New York, New England and the Southern States for the following goods, which we offer at factory prices.



Flat Bottom Tea Kettle.



Round Boiler.



Stove Pot, Flat Bottom.



THE POCASSET IRON WORKS,

Southern Hollow Ware.

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TINNED AND ENAMELED WARE.

No charge for packages when shipped from factory.

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HARRISBURG NAIL WORKS,

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Nails and Spikes.



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W. L. SANDS & CO.,

Sad Irons and Thimble Skeins.

READ, STEVENSON & CO,

(Except New England.)

Nova Scotia Grindstones.

J. McDERMOTT & CO.,

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We carry here, for immediate shipment, the largest and best assorted stock of all the above goods to be found in the market.

WE ALSO OFFER, AT WHOLESALE ONLY,

Iron & Steel, Springs & Axles, Burden Horse Shoes, Railroad Supplies, &c.



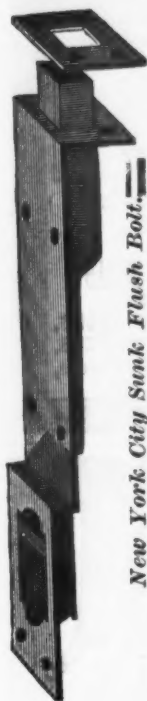
THE STANLEY WORKS,

MANUFACTURERS OF

Strap and T Hinges, Wrought Iron Butts, Flush Bolts and other Door Bolts, Washers, Etc.

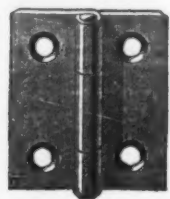
FACTORIES, New Britain, Conn.

WAREHOUSE, 79 Chambers St., New York.

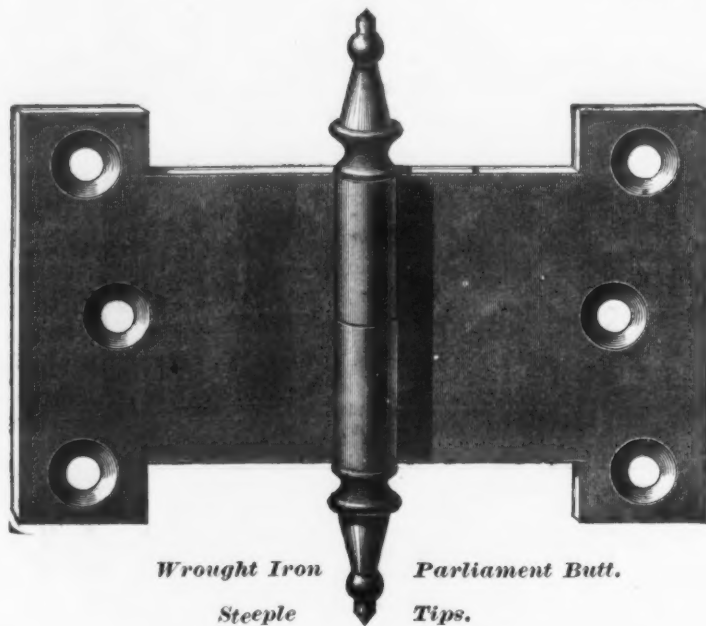


New York City Sunk Flush Bolt.

Bronzed and Plated Butts.
Wrought Japanned Butts, with Acorns.
Wrought Narrow and Broad Butts.
Wrought Reversible and Loose Joint.
Wrought Table Hinges and Back Flaps.
Wrought Light Narrow Butts.
Wrought Light Inside Blind Butts.
Wrought Parliament Butts.
Japanned Screws.



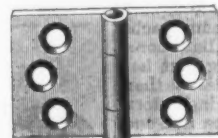
Light Narrow Butt.



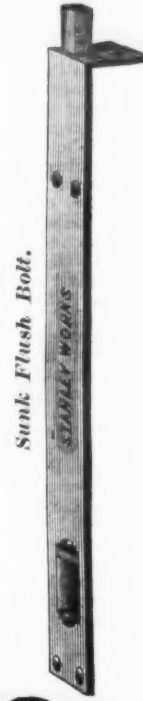
Wrought Iron
Steeple

Parliament Butt.
Tips.

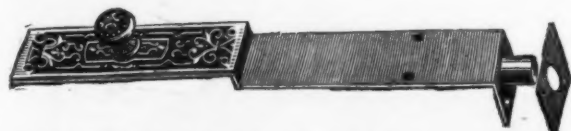
Bronzed and Plated Bolts.
Wrought Flush Bolts.
Wrought Barrel Bolts.
Wrought Square Bolts.
Wrought Shutter Bolts.
Wrought Tower and Neck Bolts.
Canada Bolts.
Wrought Hasps and Staples.
Wrought Chest Handles, Etc., Etc.



Light Inside Blind Butt.



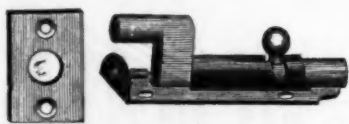
Sunk Flush Bolt.



New York City Sunk Flush Bolt, Bronze Metal Cap, Knob and Slide.



B. K. Flush Bolt, Extra Heavy.



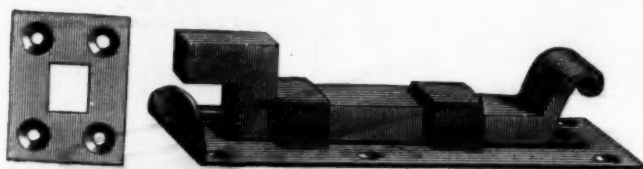
Wrought Iron Round Neck Bolt.



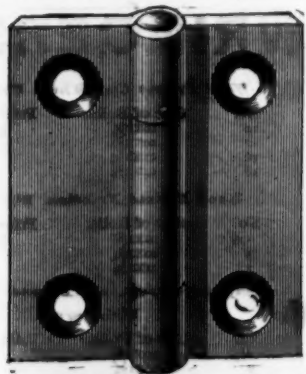
Wrought Iron B. K. Barrel Bolt.



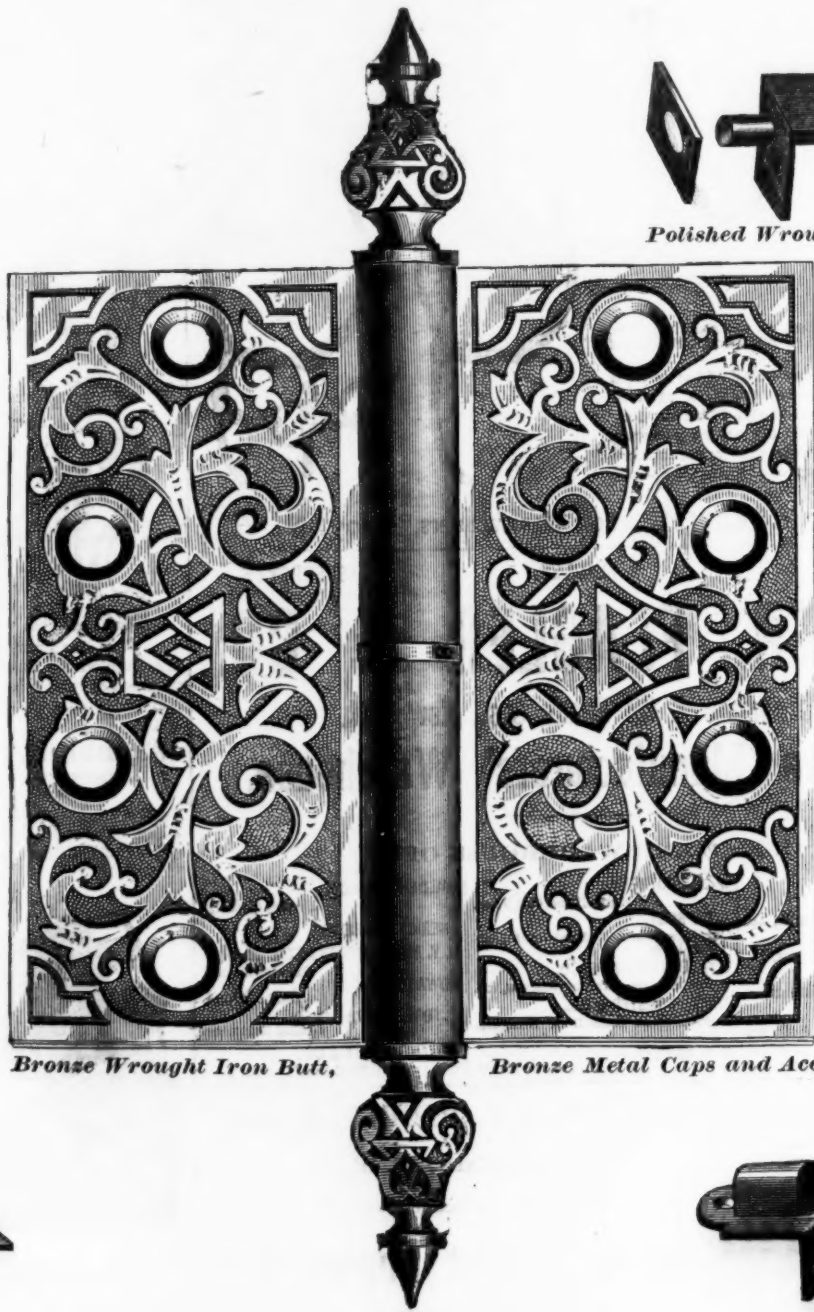
Wrought Iron Square Bolt.



Wrought Iron Square Neck Bolt.



Wrought Narrow Butt.

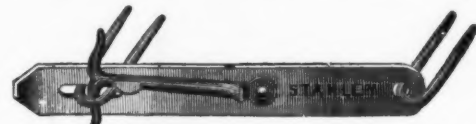


Bronze Wrought Iron Butt,

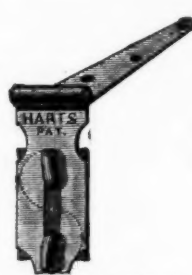
Bronze Metal Caps and Acorns.



Polished Wrought Iron Flush Bolt, Bronze Metal Knob & Slide.



Hasp and Staple with Double Hook.



Double Swivel.



Single Swivel.



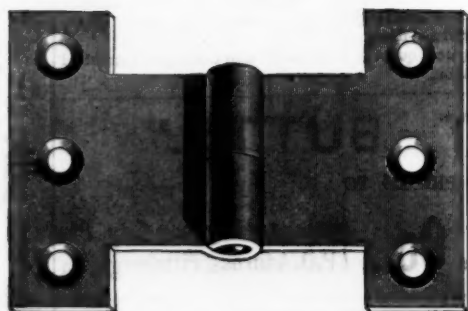
Hinge Hasp.



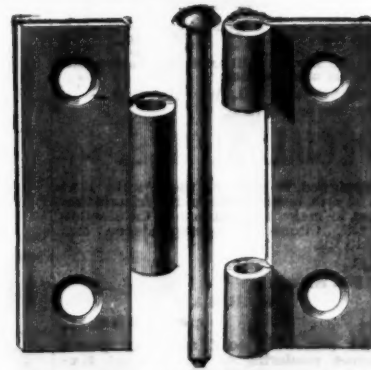
Heavy Strap Hinge.



Wrought Iron Tower Bolt.



Light Wrought Parliament Butt, Bright Iron.



Loose Pin Light Narrow Butt.

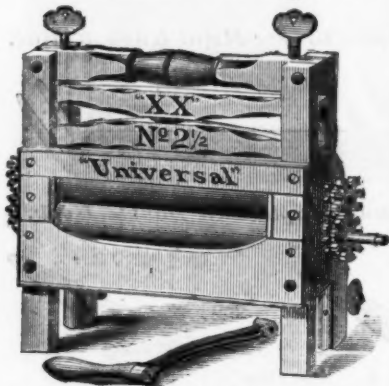
Goods furnished Plain, Galvanized, Tinned, Japanned, Bronzed, Silver and Nickel-Plated.

We have a full stock on hand, and can fill orders promptly.

Spontaneous Combustion.—The recent discussion of this subject in the *Journal of the Society of Arts*, London, is noticeable from the position assumed, that while, strictly speaking, there is no such phenomenon as spontaneous combustion, the inflammation of various organic and inorganic substances without the immediate contact of ignited matter—the fact that has given rise to the term—is nevertheless as certainly the result of some direct act or acts which can be accurately traced as is the firing of a lucifer match when struck on a rough surface. In regard to the liability of certain articles to take fire when stored in bulk—that is, bodies containing so much bound-up heat as do the vegetable fibers of all kinds, more particularly hay, cotton, &c., coal of all kinds, oily rags, greasy sawdust, varnish, rags, &c.—it is asserted that spontaneous combustion of these substances can only take place when they are so packed that small increment of heat may be stored up; if these are freely exposed to the air, the heat evolving action which goes on with it may be increased rapidly—as when the hand is waved in mobile air, the infinitesimal blows are free to rebound and react over so large a space that their effect is dissipated—but when their striking space is limited, they act like the struck air inclosed in a fire syringe, their heat motion is intensified by concentration, and ultimately throws the whole mass into such commotion that the moving power is manifested as light as well as heat. That there must be a beginning to this heat motion is of course certain. Thus oiled rags and bodies of that kind derive the initial movement from the oxidation of the oil; perfectly dry vegetable fiber, at ordinary temperatures, oxidizes extremely slow. Oils, however, are formed at the expense of a still larger amount of heat than vegetable fiber.

The Herreshoff Manufacturing Company of Bristol, R. I., are building a steam yacht 100 feet long for a gentleman in Baltimore, one condition of the contract being that her speed will be five miles per hour faster than any steam yacht has ever shown in Eastern waters. She will have a composite hull and accommodations of the most comfortable and luxurious character. There will be two large saloons, several state rooms and bath-rooms.

THE "OLD RELIABLE" UNIVERSAL Clothes Wringer.



Improved with Rowell's Double Cog-Wheels on both ends of each roll.

Over 500,000 sold!

And now in use, giving "Universal" satisfaction.

EVERY WRINGER WARRANTED.

Be sure and inquire for the "Universal."

Sold by the Principal Jobbers in Hardware and House-Furnishing Goods everywhere.

Special rates given for export.

Metropolitan Washing Machine Co.
32 Cortlandt St., New York.

THE PRATT & WHITNEY CO.,

Hartford, Conn., U. S. A.,

Make specialties of

DROP HAMMERS,

Punching Presses, Hand Drilling Machines, Ratchet Drills, Combination Lathe Chucks, Cutters for Teeth of Gear Wheels, Screw Plates, Hand Machine, Nut and Pipe Taps, Bolt Cutters, &c., &c.

ANVIL & VISE COMBINED.



No. 1, 10 1/2 x 4 in. face, 4 in. jaw Vise, weight 40 lbs., \$4.50
No. 2, 8 1/2 x 3 1/2 in. face, 3 1/2 in. " " 25 " 3.75
No. 3, 6 1/2 x 2 1/2 in. " 2 1/2 in. " 15 " 3.00
The face of the Anvil is chilled hardened. Terms cash.
Delivered on cars at Worcester.

RICHARDSON MFG. CO., Worcester, Mass.
Liberal discount to the trade.

SPECIAL NOTICE.

The undersigned, in view of the Paris Exhibition of 1878, begs to inform his friends that he continues to make translations of Catalogues, Prices-current, Circulars, Correspondence, &c., from and into the

ENGLISH, FRENCH, GERMAN, and SPANISH,

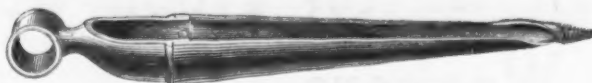
and that he bestows special attention upon a strictly correct rendering of Technical Expressions in matters relating to Machinery, Metallurgy, Hydraulics, &c. The very best reference will be furnished from leading manufacturers in this city, Philadelphia and elsewhere, for whom he has translated. If desired, estimates will be procured for the setting up, electrotyping and printing of, catalogues, &c., in the above languages.

C. KIRCHHOFF,
Metal Reporter of The Iron Age,
53 Reade St., New York

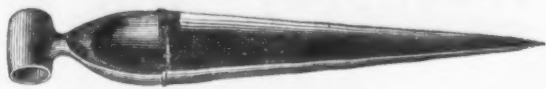
WM. A. IVES & CO.,

New Haven, Conn.

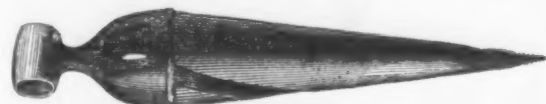
IVES' PAT. TAP BORERS.



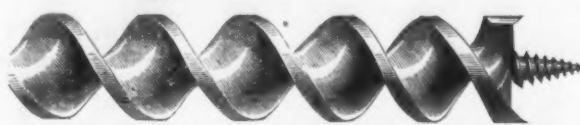
No. 1, Half Round, Scroll Point.



No. 2, Half Round.



No. 4, Volute.



Ives' Extra Cast-Steel Auger Bit.

(Old Style.)

It is believed to be in all respects the best and most perfect common Bit ever made. Its use will demonstrate the fact. Its point shows a single, not a coarse, thread.

No. 3, for Millwrights.



Sectional View of the Snap.

If you want the best at reasonable prices, send for illustrated circular and price list of the celebrated

Covert Harness Snap, Horse and Cattle Ties, Breast Chains, Halter Chains, Post Chains, Rein Chains, &c.

These goods are sold by all leading jobbers in General and Saddlery Hardware at manufacturers' prices. Sample snap sent free of charge if desired.

Address

COVERT MFG. CO., Sole Manufacturers, Troy, N. Y.

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Draw Knives, Chisels, &c.

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Bits, Corkscrews, &c.

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The "Boss" Coal Hod was patented February 23, 1878. It is made of best refined iron; bottoms double seamed and riveted, and is so constructed that the mouth cannot become choked while discharging coal. Suitable for stove, grate, range or furnace fires.

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SMOOTHING AND POLISHING IRONS,

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BUY THE BEST MICHIGAN STOVE



DETROIT, MICH. SUPERIOR TO ALL OTHERS

With our present large variety and constant additions of new Patterns, we are enabled for the Season of 1878 to meet the requirements of all. To the Dealer who is desirous to secure the Best Stoves in the market, we would solicit he correspond with us and order Samples which we will guarantee to fully meet all recommendations.

We manufacture Stoves for burning all kinds of fuel.

THE GARLAND BASE BURNER,

Acknowledged Favorite, will appear for season of 1878 with entire changes, which cannot fail to make it the Leading Base Burner.

Send for descriptive catalogue, price list, &c.



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Patented April 30, 1878.

The cheapest and best galvanized Lemon squeezer in the market.

Manufactured and for sale by **W. & J. TIEBOUT,**
Manufacturers of BRASS GALVANIZED & SHIP CHANDLERY HARDWARE, 290 Pearl St., New York.

KEYSTONE WRINGERS.



No. 20, Family Size, with Cog Wheels.

Wood Frame Cog-Wheel Wringers.

No.	Size of Rolls.	Price per doz.
10	10X1 1/2	\$60.00
12	10X1 3/4	63.68
16	11X1 3/4	68.00
18	11X1 7/8	71.00

Wood Frame Friction Wringers.

No.	Size of Rolls.	Price per doz.
1 1/2	10X1 1/2	\$51.00
1	10X1 3/4	54.00
3	11X1 3/4	62.00

Self-Adjusting Iron Frame Friction Wringers.

No.	Size of Rolls.	Price per doz.
2 1/2	10X1 1/2	\$1.00
2	10X1 3/4	54.00
4	11X1 3/4	62.00

Warranted greater capacity than any other wringer.

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Heavy Hardware & Railway Supplies.

AGENTS FOR
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And Other Manufacturers.



CLIMAX BARN DOOR HANGERS, MOORE'S

Anti-Friction Sliding Door Sheaves,
"Folant" Barn Door Catches,
&c., &c.

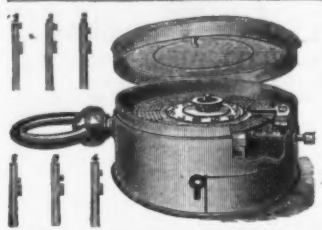
The "Climax" is recognized as the **Leading Hanger** in the market. It is **altogether superior** to any other Barn Door Hanger ever made. In the "Climax" is a **complete wheel** provided with Anti-Friction Bearings. It is practical, hence its widespread popularity. It is the **only Anti-Friction Hanger having a Wheel**. The trade are cautioned against imitations, made to sell, and which are without any mechanical principles to recommend them.

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The main wheel contains four anti-friction wheels which revolve upon axles fast in its sides. The main wheel revolves nine times while the anti-friction wheels are revolving once.

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IMPORTANT FOR ALL LARGE CORPORATIONS
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Capable of controlling with the utmost accuracy the motion of a watchman or patrolman as the same reaches different stations of his beat. The instrument is complete in itself, portable and as reliable as the best lever watch. It requires no fixture or wires communicating from room to room, as is the case with the ordinary watch clocks. A small, inexpensive stationary key is alone required at each station. The instrument will, in all cases, be warranted perfect and satisfactory.

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SOLE AGENTS FOR

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HORSE CLIPPERS.

The cutting parts are made of the very best English Cast Steel. The upper knife passes over two teeth. There is a protecting plate which gives the Clipper great strength. The iron parts of the handles are all wrought, not malleable, iron, and adjusted so that there is no danger of the handles getting broken. Every Clipper is carefully examined before leaving the factory. Quick and easy working can be guaranteed.

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Of every description, including

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Manufacturer of every kind of

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AMERICAN SAW CO.,

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Movable Toothed Circular Saws,
PERFORATED CROSS-CUT SAWS
And **SOLID SAWS** of all kinds. Trenton, N. J.



Circulars, Cross-Cuts, Mill
Muley, Gang, Hand,
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Molding and Planing Knives
Plastering Trowels, Miter-
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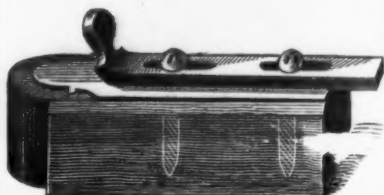
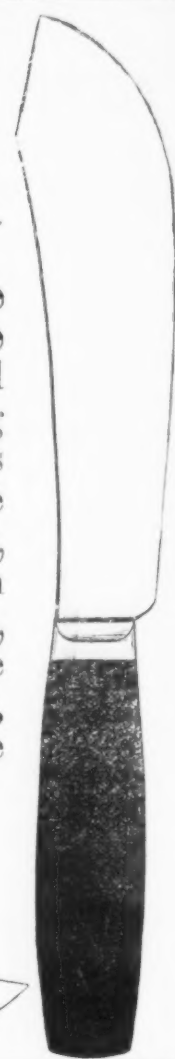
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Best Handle! Best Blade! Best Style!

There is no question but that a solid-handled Table Knife is much more preferable than a scale tang. The Woods Patent has stood the test of years, and is admitted by our competitors to be the strongest and best fastening ever yet invented. Handles and blades fastened by this process can never get loose. No dependence is made upon any unreliable welding processes or uncertain cement, but it is a sure thing every time. Our new styles, which have been wonderfully improved within the past 30 days, are unequaled in beauty and uniformity, and prices are "hard pan." We make the **best Butcher Knives on earth**, and warrant them the best every time. Shoe Knives are our "Hobby."

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Cut Showing how Blade is firmly held by Handle.



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For Fastening Window Screens, Cabinet Ware, &c

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Warranted free from any trace of Lead, and especially adapted for

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Superior for Liquid PAINT on account of its body and wearing properties.

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ANCHOR BRAND AXLES,

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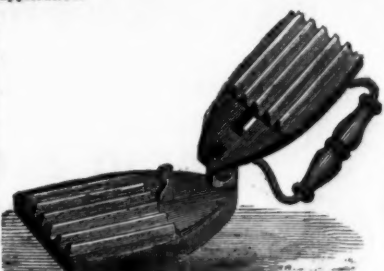
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With Brass or Nickel Flutes. Prices furnished upon application.



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Wholesale Manufacturer of

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FIRE SHOVELS, Etc.

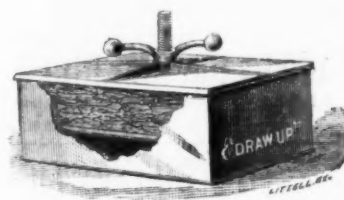
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"DRAW-UP" PRESSES.

Prices much lower than other styles.



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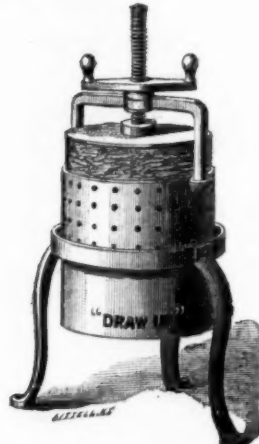


Square Press, for Cold Meats, &c.

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The Cake Being Removed.

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Compare with other styles of Presses.

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THE VERY BEST SPRINGS AND AXLES.

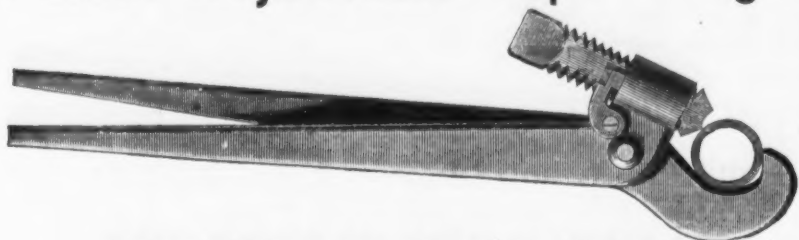
Our Standard Springs, weighing about half as much as the Springs of other makers, to do the same work cost but little more per vehicle than a common Spring. Our Jam-b-screw, Colling Collar, Parallel Arm, Malleable Iron Box Axles are the best in the world. Exclusive makers of

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Swedes Iron, Upholsterers', Gimp & Cut Tacks.

TINNED, LEATHERED AND LARGE HEAD IRON CARPET TACKS.

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Lining, Saddle and Tufting Nails, Coffin Tacks and Tufting Buttons.

COPPER, ZINC, STEEL, AND SWEDS AND COMMON IRON SHOE NAILS, &c.

Regular and Chisel Pointed Boat Nails of Copper, Iron or Galvanized, Copper, Brass

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Box Nails, 2d & 3d Fine Nails, Roofing Tacks and Nails, &c., &c.

Made by the **AMERICAN TACK CO.**, Fairhaven, Mass.

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THE CONNECTICUT VALLEY MFG. CO.,

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Lewis' Patent Single Twist Spur Bits,



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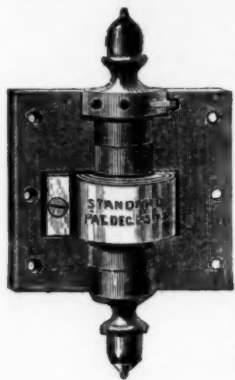


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MASON MANUFACTURING COMPANY.

Manufacturers of

**Standard Patent
Spring Hinge.**



PRICES.

Single-Acting,

Per pair.

2x2	1.00
2 1/2x2 1/2	1.50
3x3	2.00
4x4	3.00
5x5	4.00
6x6	5.00

Discount to the Trade.

Manufacturers of

**Perfection
Step Ladder.**



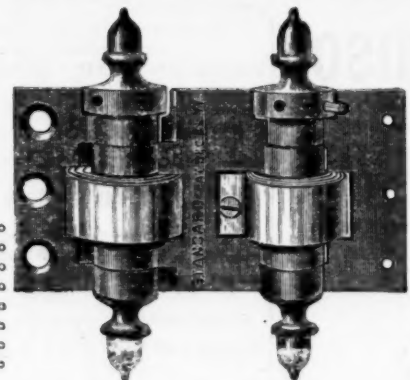
PRICES.

3 feet	\$2.50
4 "	3.00
5 "	3.50
6 "	4.00
7 "	4.50
8 "	5.00
9 "	5.50
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2 1/2x2 1/2	\$2.00
3x3	3.00
4x4	4.00
5x5	5.00
6x6	6.00
7x7	7.00

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Manufacturers of Step Ladders, House Furnishing Goods and Jobbers in general Hardware. Send for our Price List.

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Price, \$5.00.
In Morocco Case,
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MICROMETER CALIPER,
Made by THE VICTOR SEWING MACHINE CO.
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This attractive and very desirable tool will be found more reliable and convenient than the Vernier Caliper, and to Machinists and Tool makers it is indispensable on work requiring very accurate and close measurement. Its capacity is one inch, and is graduated to one thousandths, but can readily be set one-half and quarter thousandths; and is so constructed that any wear resulting from use can be readily adjusted.

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McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

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For STEAM, WATER and GAS.

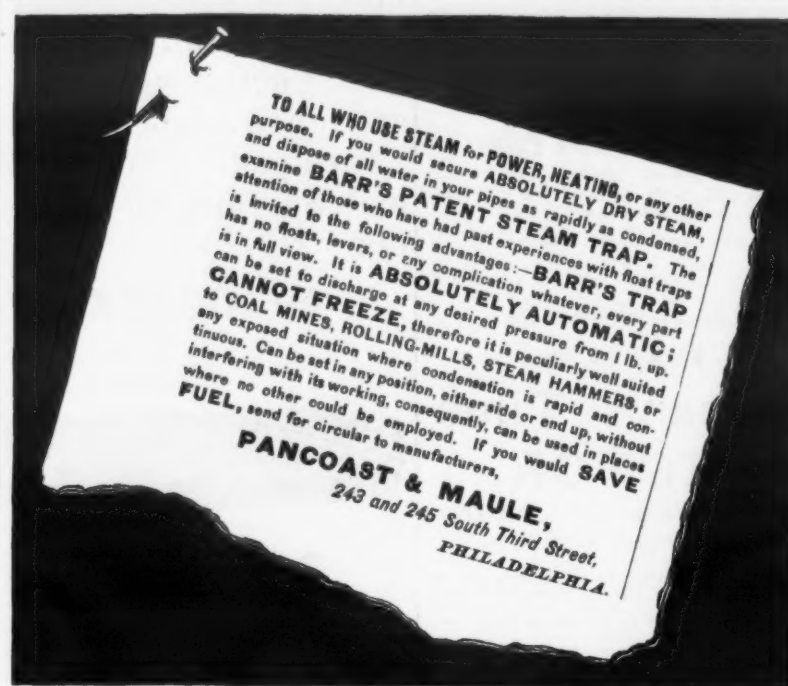
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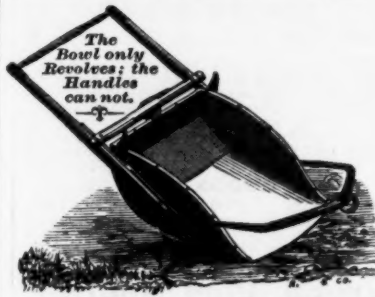
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TO ALL WHO USE STEAM for POWER, HEATING, or any other purpose. If you would secure ABSOLUTELY DRY STEAM, and dispose of all water in your pipes as rapidly as condensed, examine **BARR'S PATENT STEAM TRAP.** The attention of those who have had past experiences with float traps is invited to the following advantages:—**BARR'S TRAP** is in full view. It is ABSOLUTELY AUTOMATIC; it can be set to discharge at any desired pressure from 1 lb. up to COAL MINES, ROLLING-MILLS, STEAM HAMMERS, or any exposed situation where condensation is rapid and continuous. Can be set in any position, either side or end up, without interfering with its working, consequently, can be used in places where no other could be employed. If you would SAVE FUEL, send for circular to manufacturers.

PANCOAST & MAULE,
243 and 245 South Third Street,
PHILADELPHIA.

Automatic Revolving Scraper.



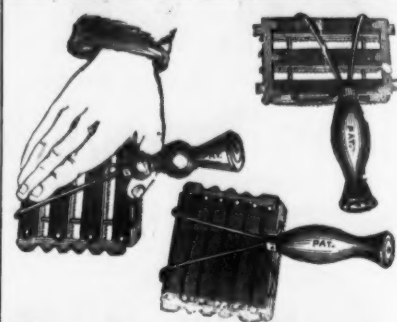
Iron or Steel Bottom.

Nothing equal to our Revolving Scraper for removing earth.

Also, Contractors' Plows and a full line of Barrows.

Send for circular.

REVOLVING SCRAPER CO. Columbus Ohio.



The Perfect Comb.

We call your attention specially to our new patent wire comb. The result of a long series of experiments, made with a view to meeting all the requirements of a Perfect Comb. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the bones while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly held, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate its name: **The Perfect Comb.**

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Factory and Office,

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WM. S. CARR & CO.

Sole Manufacturers of



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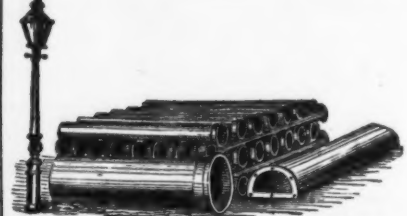
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Closets,

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Philadelphia,

Manufacturers of

Cast Iron Pipe

FOR WATER AND GAS.

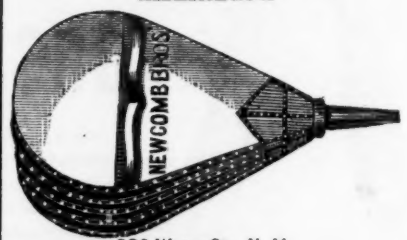
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Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.

NEWCOMB BROS.,

Manufacturers of



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**Reversible
Nozzle.**

These Bellows are well adapted and put up for export trade.

I manufacture all sizes, with or without this improvement.

NEW YORK and BOSTON Pattern

STORE TRUCKS.

Railroad, Warehouse, Platform and Block Trucks, all sizes.

Manufactured only by

H. N. HUBBARD,

323 East 22d St., New York.

Reduced prices. Catalogues furnished.



CHAMPION
ELASTIC EXPANSION
RUBBER BUCKET
FOR
CHAIN PUMPS
PATENTED AUG. 14, 1877.
SEND FOR PARTICULARS
EBERHARD MANUFACTURING CO
CANTON OHIO.
Sole Manufacturers.

The Magic Carriage & Wagon Jack.

Patented April 23, 1878.

PRICE, - - \$12.00 per doz.

Liberal discount to the trade.

MAGIC JACK CO.,

Sole Manufacturers and Proprietors,

MISHAWAKA, IND.

Sargent & Co.,

Agents.



Daman

STANDARD
HOLLOW AUGERS.

C. C. HARLOW & CO.,

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Manufacturers of DAMAN STANDARD HOLLOW AUGERS.—Universally acknowledged superior to any other in the market. They have recently been improved, making them, as now offered to the trade, the most perfect tools of their kind, either in design, material or workmanship. SPOKE AND DOWEL TRIMMERS.—The very best as well as the cheapest. METALLIC COMBINATION FLOW PLANE.—Made of solid cast steel and of gun metal. Of an entirely new design. Can be used as Groover, Dado and Rabbit Plane. In any direction of the grain, and also as a Match Plane. COMMON SENSE DOOR SPRING.—The most durable and cheapest Door Spring yet made. LEAD PIPE CUTTERS.—To cut lead pipe in any position and without chips or burrs. Please send for circulars and prices.

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New Style
Warehouse
Scales.
—
Iron Tops.

Riehle Bros.' Machines for testing Band Iron, Wire, and all other materials, by tensile, transverse, and crushing strains, from 100 lbs. to 500 tons capacity. New Machine for testing lubricants. Scales for Railroads, Elevators and Wharves. Scales for Furnaces, Rolling Mills, Mines, &c. Testing Machines adopted by U. S. Government. Specimens of materials tested daily at the Works. Trucks for Depots, Warehouses, etc. Highest Centennial Award. Office & Works, 9th St., above Master, Philadelphia. Warehouses, 42 & 52 4th St., Philadelphia. New York Office, 31 Liberty St.



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MANUFACTURERS OF
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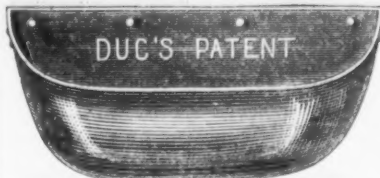


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ALSO MANUFACTURERS OF
LINSEED OIL.
182 Front Street, NEW YORK
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White Lead, Red Lead & Litharge.
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FISHER MOWE, TREASURER

DUG'S IMPROVED ELEVATOR BUCKET.



THE STORE-HOUSE BUCKET.
(Partial straight front.)
In 12 in., 14 in., 16 in. and 17 in. Sizes.

Made of Best Charcoal Stamping Iron.
No Corners to Catch.
Requires Less Power.
The only Scientifically Constructed Elevator Bucket in the Market.



THE MILL BUCKET.
In 3 1/2 in. to 10 in. Sizes.

T. F. ROWLAND,
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NICHOLSON FILE CO., Manufacturers of FILES AND RASPS.

Filers' Tools & Specialties.

Manufactory and Offices at Providence, R. I.

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IMPROVED BUTCHERS' STEELS.

Patented December 25th, 1877.



REGULAR STEEL.



PATENT STEEL.

BENT RIFFLERS—Handled.



HAND BASTARD.



ROUND RASP.



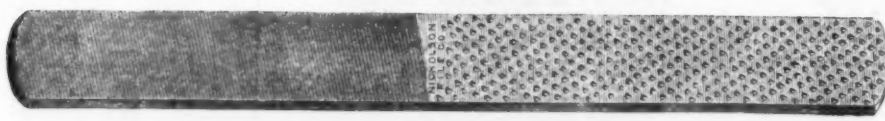
FLAT FLOAT (Safe Sides).

BREAD RASP.



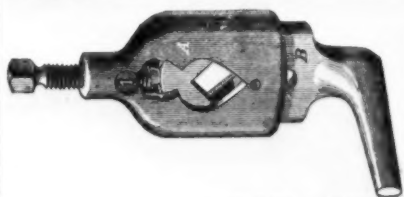
Full Size—12 inches.

JIG RASP.



Full Size.

ROLLER FILE.



NORTH'S PATENT Universal Lathe Dog.

It is very strong. Holds very strong. Will not deface finished work. Holds round, square or irregular work. Always stands up square with the work and will not "skew." Is more evenly balanced than the common dog.

Send for circular.
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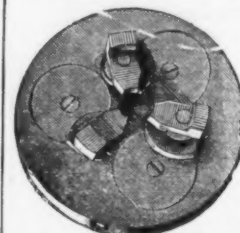
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JOHNSON'S PATENT UNIVERSAL LATHE CHUCK.



We invite attention to the superior construction of this chuck. Its working parts are absolutely protected from dirt and chips. It is strong, compact and durable, and will hold the greatest variety of work, as the jaws are adjustable with a range the full diameter

ter of the chuck. For Price List address:
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PRICE LIST.			
To Lift.	To Raise.	Price.	Ex. Ft.
8 ft.	500 lb.	\$22 50	\$1 00
8	1,000	24 00	1 25
8	2,000	30 00	1 50
8	3,000	40 00	1 75
9	4,000	50 00	2 00
10	5,000	75 00	3 25
10	8,000	95 00	4 40
12	12,000	150 00	5 75
12	15,000	225 00	6 75
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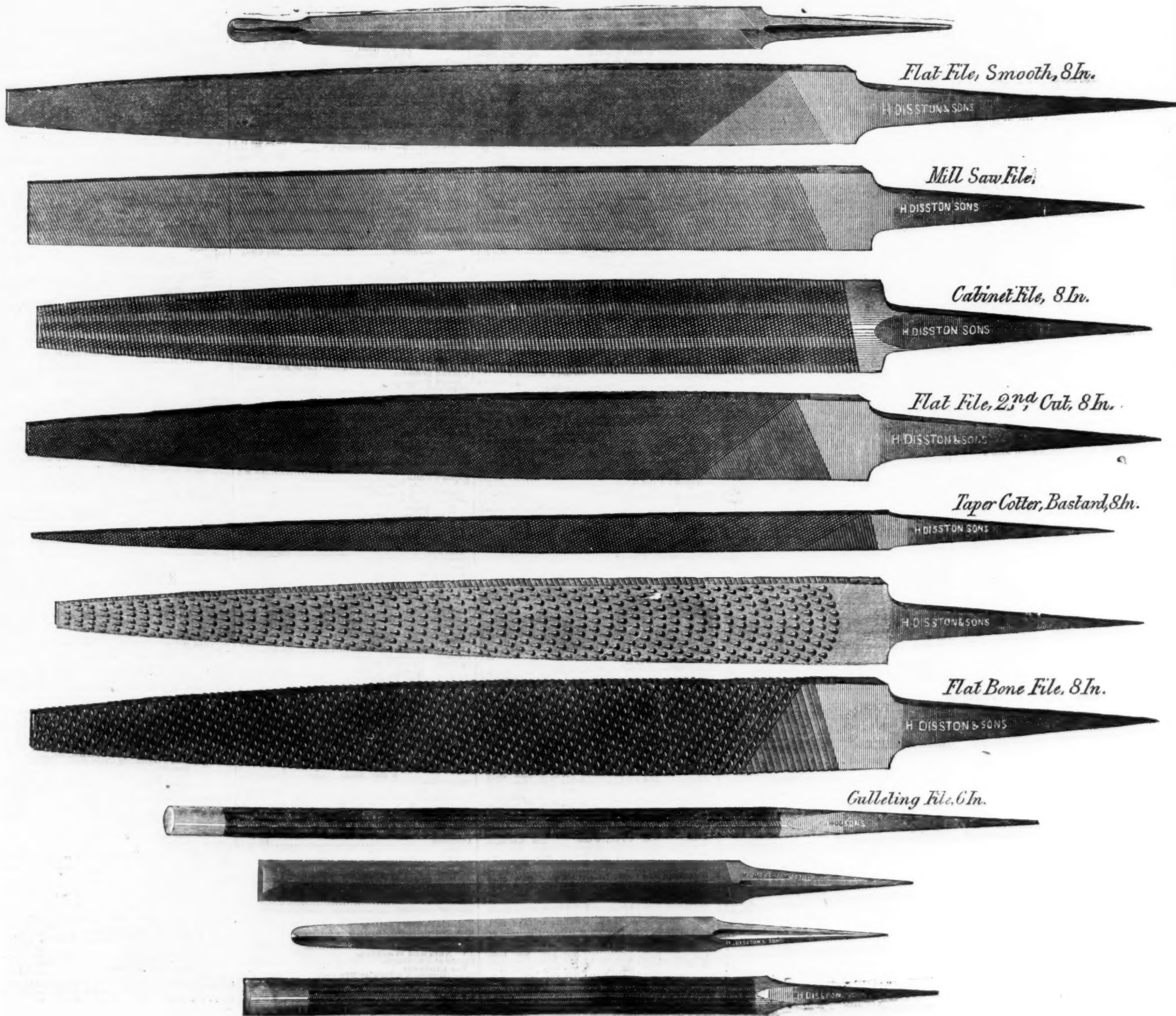
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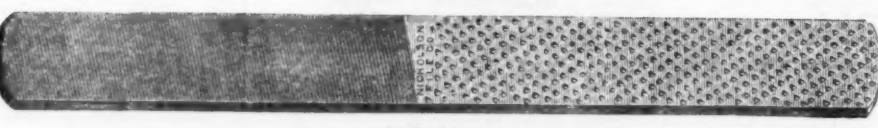
BREAD RASP.



Full Size—12 inches.

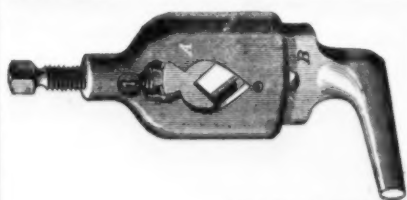


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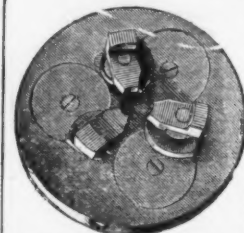
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Water, Air & Vacuum PUMPS
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11 & 16 Water St., Brooklyn, N. Y.

STEAM ENGINES,
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Cheapest and best for all purposes—simple, strong, and durable. Also Traction Engines for common roads.
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Vertical Engines, with or without wheels, very convenient, economical and complete in every detail, best and cheapest Vertical in the world. Fig. 1 is engine in use. Fig. 2 ready for road.
Fig. 1. Fig. 2.
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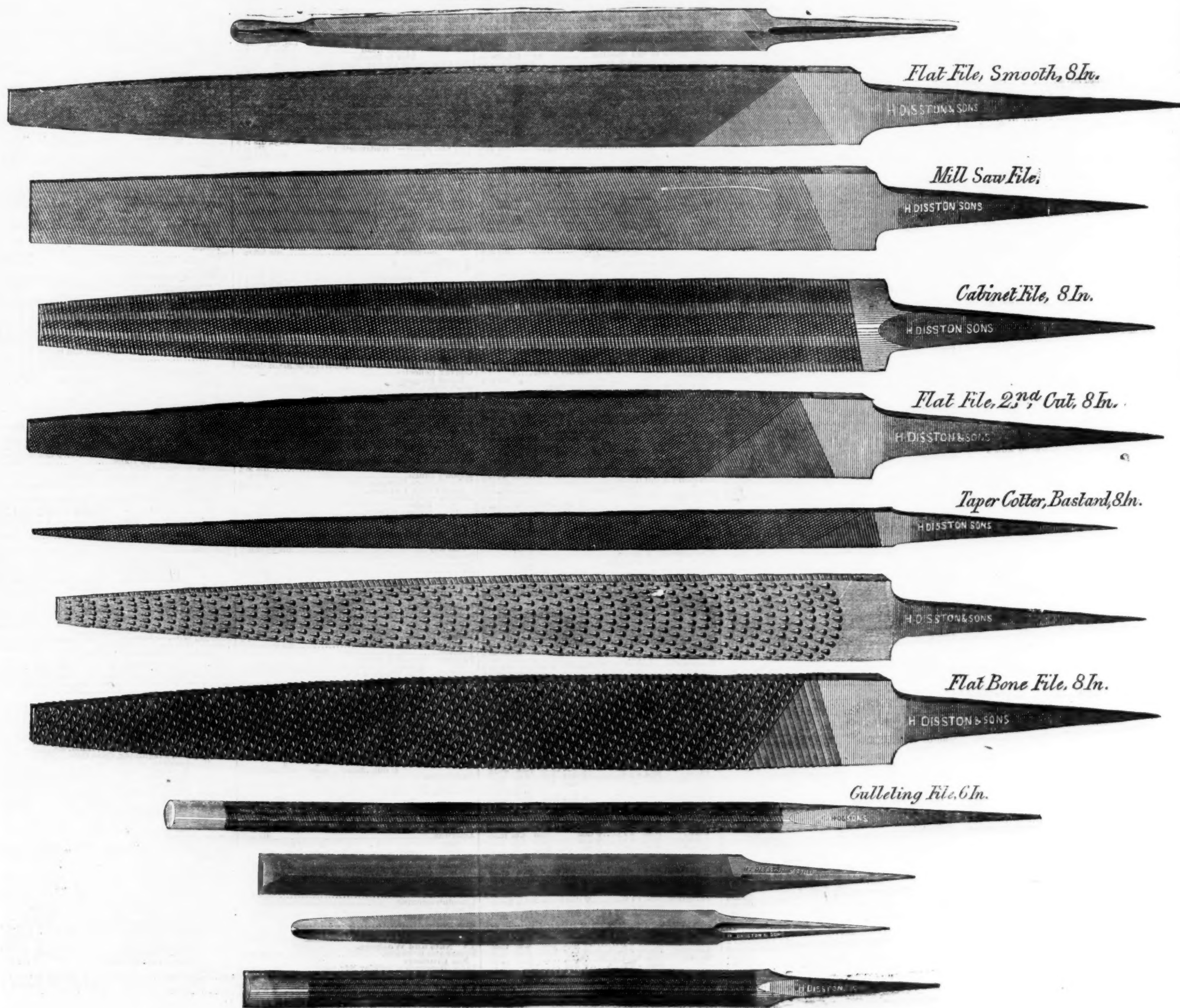
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Plane Irons, Butcher's.	75	75
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Aburn Tool Co's.	75	75
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Hudson's Patent.	75	75
Humason & Beckley Mfg. Co.	75	75
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Stanley R. & L. Co's Pat. Adjustable.	75	75
Chapin's Patent Adjustable.	75	75
Standard Rule Co.	75	75
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Jap's Side.	75	75
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"Anti-Friction."	75	75
Ranches.	75	75
Spring.	75	75
Leach's Patent.	75	75
Solid, Tinner's.	75	75
Rails.	75	75
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"Iron, Painted."	75	75
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for N. E. Hangers.	75	75
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Malleable.	75	75
Razor Straps.	75	75
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Badger's (not Emerson).	75	75
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Hunt's.	75	75
Chapman.	75	75
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Rivet Screws.	75	75
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"Lath Yarn."	75	75
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From 4 to 10 lbs.	75	75
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Walker's.	75	75
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Asph. Alum.				30
Benzine			7 gal.	150
Black				10
Dryer, Patent, Am'n		inst can	1042	keg, 30
Glue, White				30 40
Glue, Sheet				20
Shoe's Foot, Zinc				20
Gum, Copal				100
Damar				100
Shoe's, English				300
" " "		dark		100
Litharge, English				100
Mineral Wool, Zinc				150
Pumic Stone, selected Lump				4 00
Putty, in bladders		powdered		20
" " "		in bulk		20
Rotten Stone, soft, English				100
Spirits Turpentine				300
Whiting Spanish				100
GLASS.				
FRENCH WINDOW GLASS.				
Prices current per box of 50 feet.				
Single Thick.—discount 60 & 5				
SIZES.	1st.	2d.	3d.	4th.
6 x 8 10 to 15	7.50	6.75	6.50	6.50
11 14 to 16 24	8.50	7.75	7.50	7.50
13 22 30 36 30	10.75	9.75	9.75	9.75
20 28 32 34 36	15.00	11.50	9.75	9.75
26 30 37 38 44	14.50	13.25	10.75	10.75
36 48 50 52 50	15.00	14.00	11.50	11.50
30 52 30 52 44	16.50	14.00	12.00	12.00
30 50 50 54 52	17.75	15.50	13.50	13.50
34 54 54 54 60	18.75	16.50	14.50	14.50
30 50 50 54 60	20.75	18.75	17.50	17.50
Double Thick.—Discount 60 & 15				
SIZES.	1st.	2d.	3d.	4th.
6 x 8 10 to 15	\$12.00	\$11.00	\$10.00	\$9.50
11 14 to 16 24	13.75	12.50	11.75	10.50
13 22 30 36 30	17.25	15.75	14.00	13.00
15 20 24 30 36	18.75	17.25	15.50	14.50
20 28 32 34 36	21.00	18.50	16.75	15.75
26 30 37 38 44	23.25	21.25	19.25	17.50
36 48 50 52 50	25.00	22.50	20.00	18.50
30 52 30 52 44	26.75	24.25	21.75	20.25
30 50 50 54 52	27.75	25.00	22.75	21.75
34 54 54 54 60	29.85	27.00	24.00	23.00
30 50 50 54 60	33.25	30.00	27.75	26.75
sizes above 42 x 60—per box extra for every five inches				
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 durable and the handiest Earth Auger in Market
 borers three holes while any other Auger is boring one,
 easily in clay, sand, gravel or muck soil, and will cut
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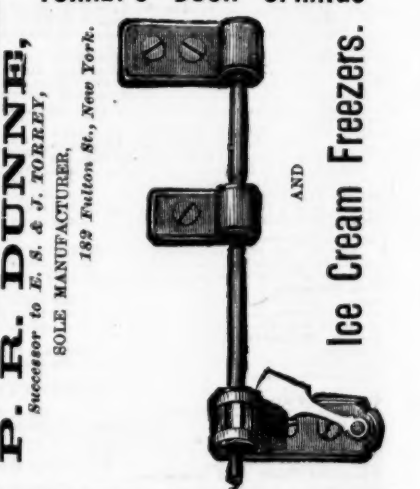
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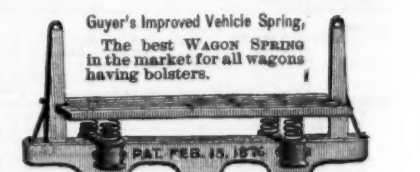
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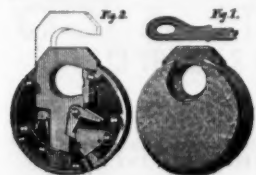
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To be used on Door 1 inch thick, or less.

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The large cut represents full size of our 5 inch Double Joint Acorn Tip Hinge for mortising.

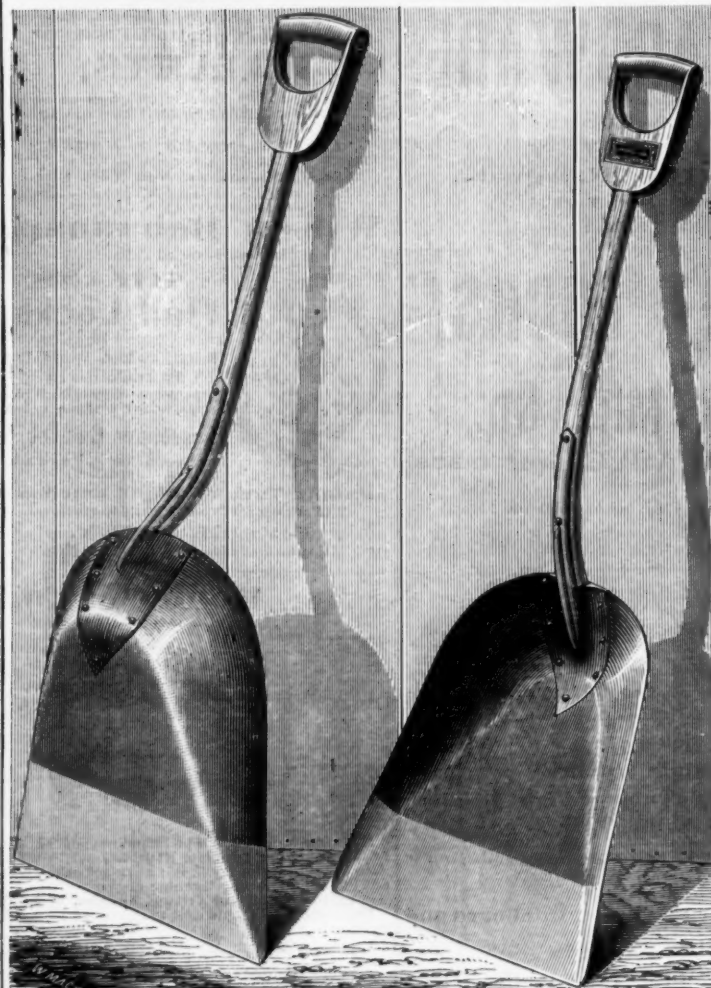
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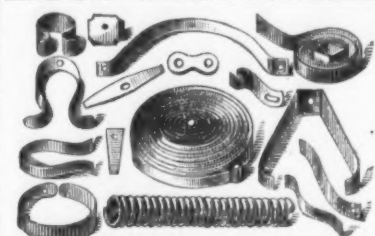
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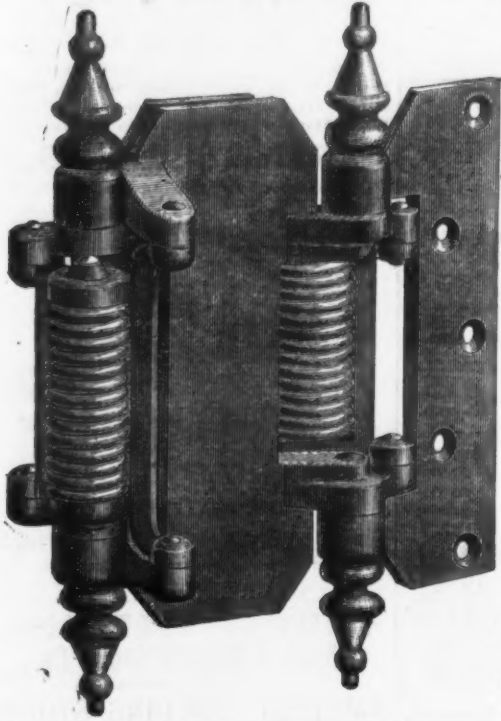
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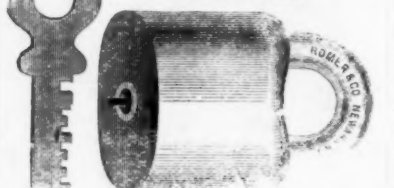
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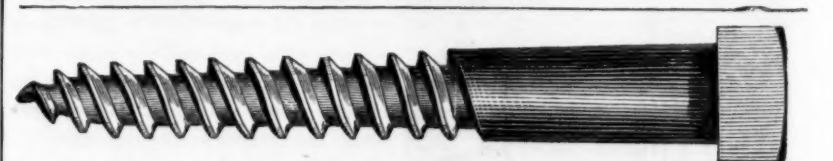
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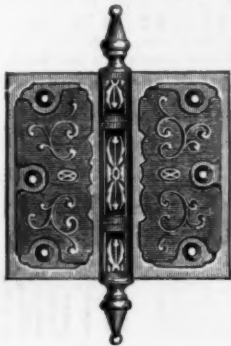
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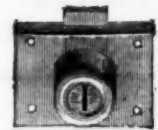
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Because they have 40 Brass Tumblers, independent in their action, either one of which will prevent the cock from being opened unless brought to proper position by the Key.

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Because we use no Springs to break or get out of place.



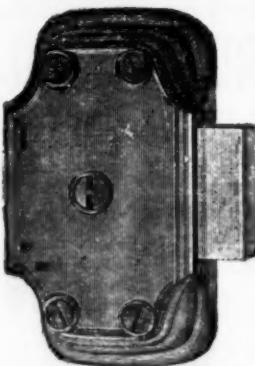
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That will not corrode or wear, and are stronger than steel.



FULL SIZE OF KEY.



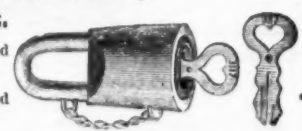
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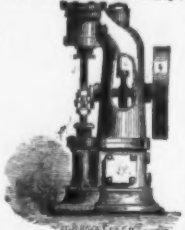
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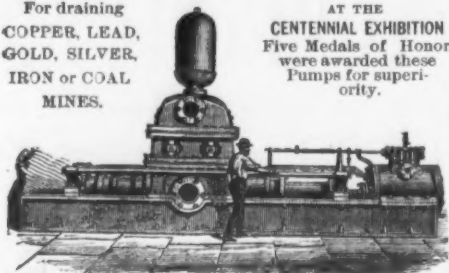
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Mayher's Patent.

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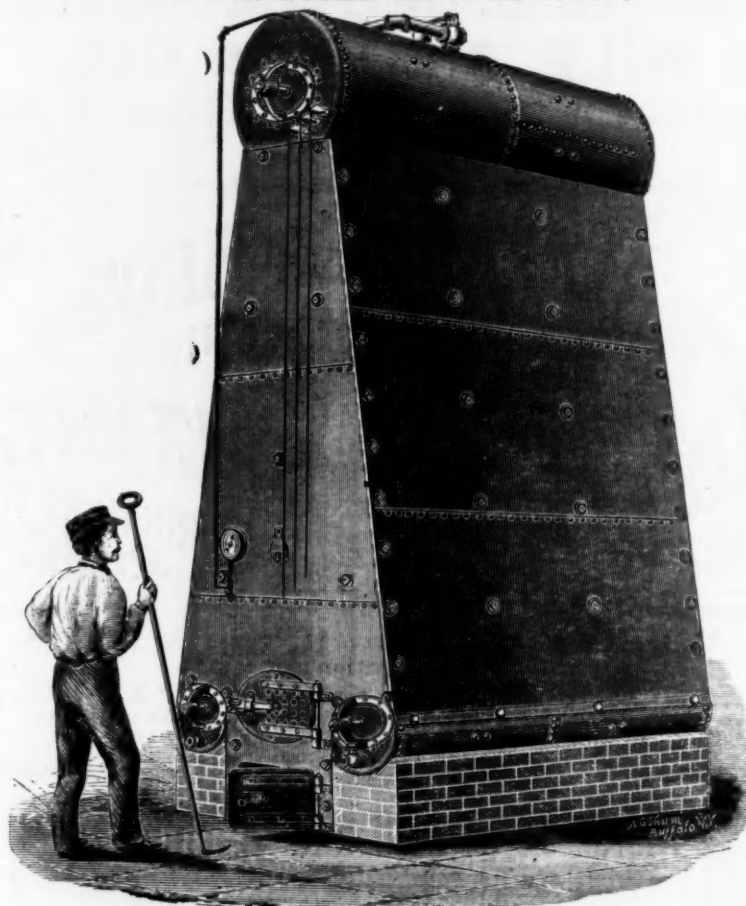
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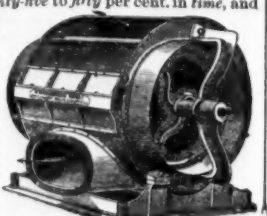
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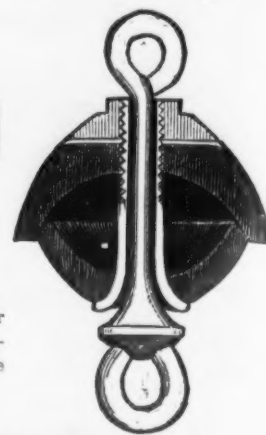
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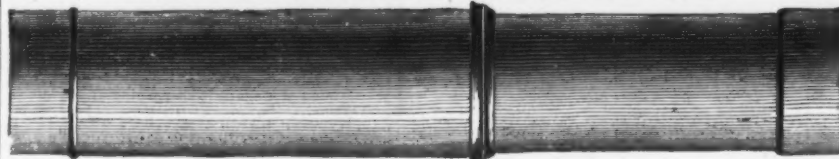
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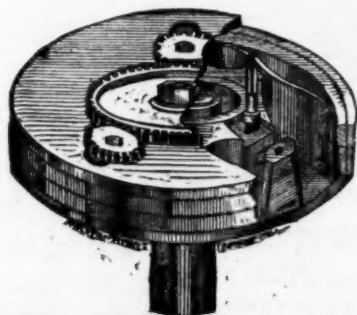
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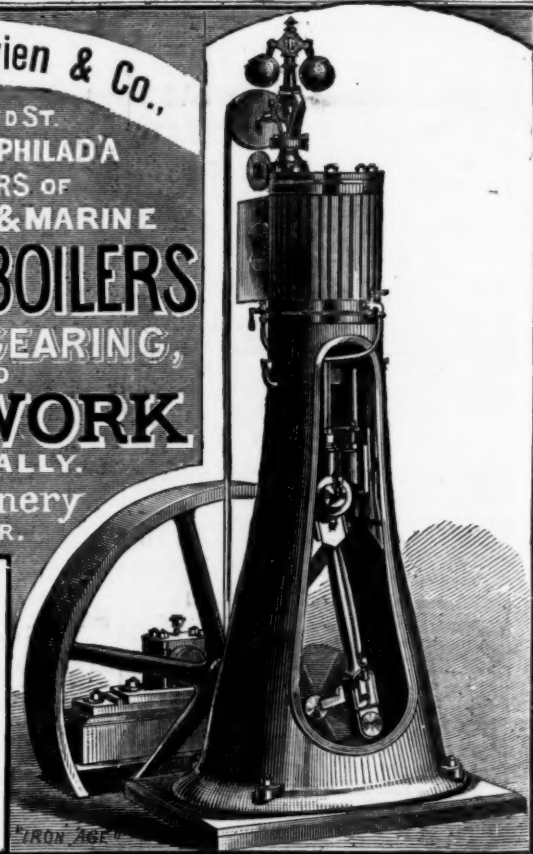
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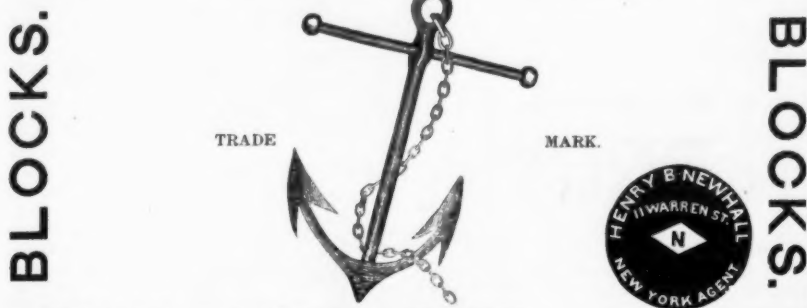


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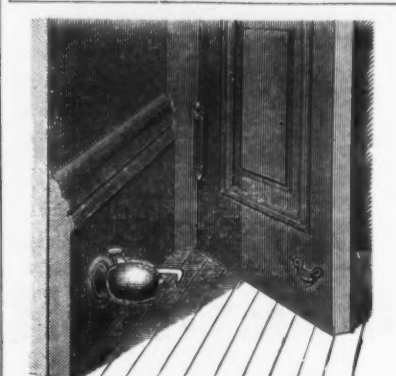
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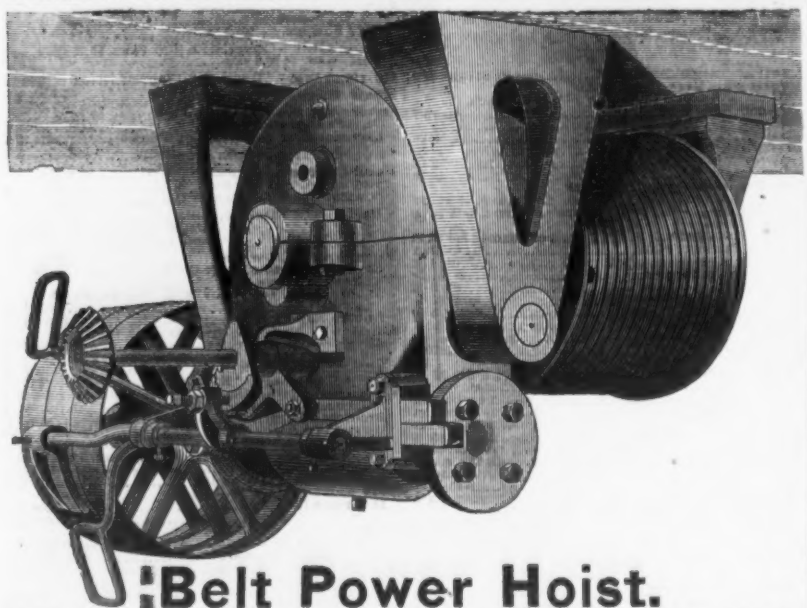
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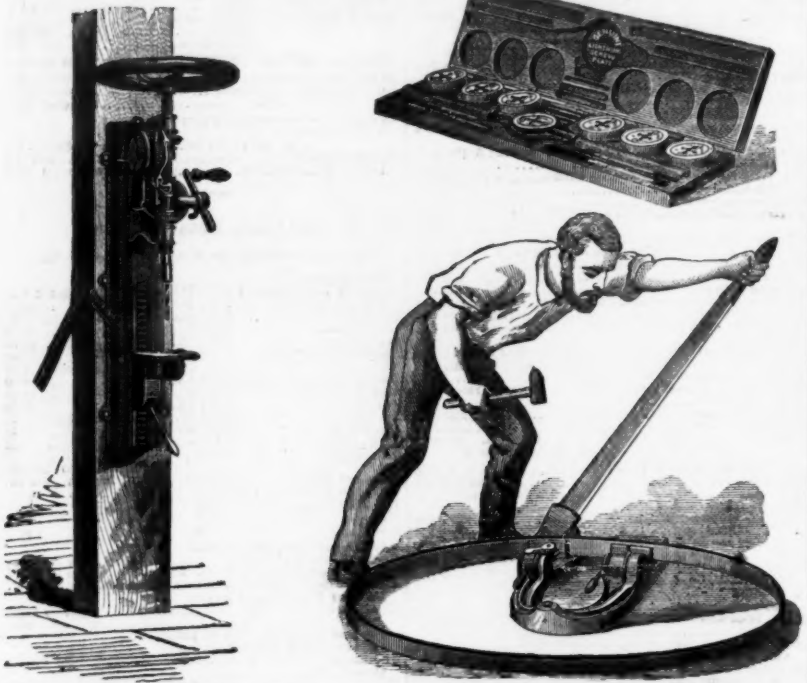
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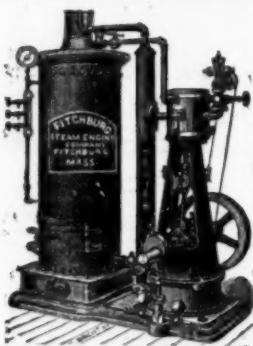
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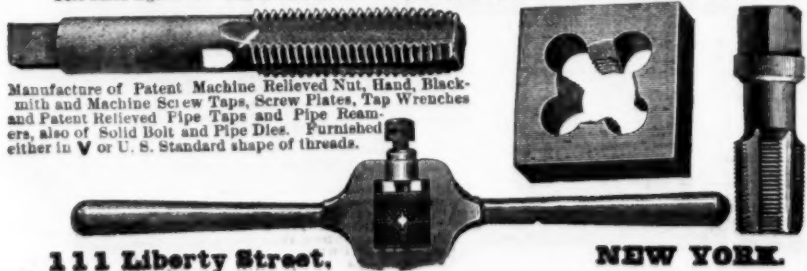
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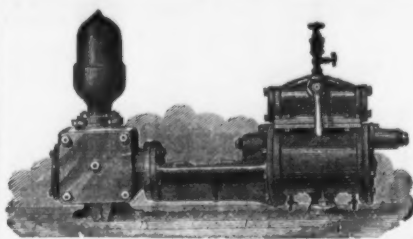
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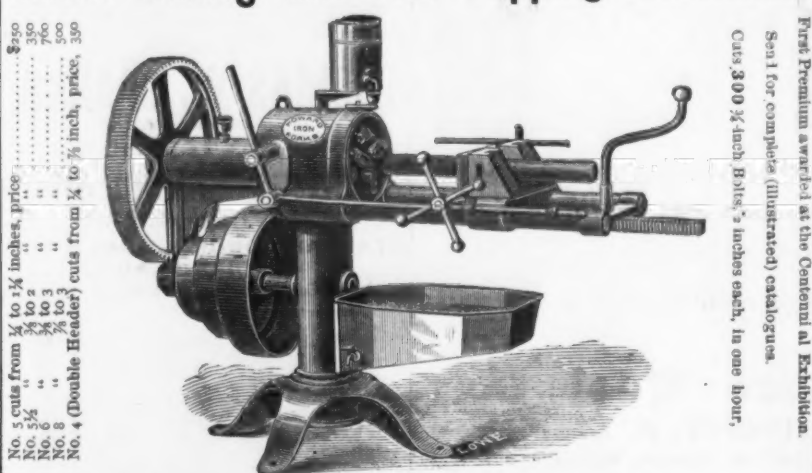
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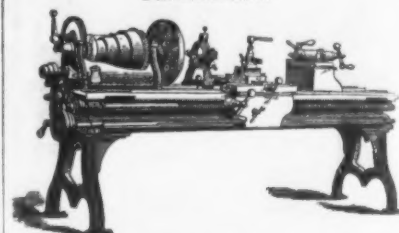
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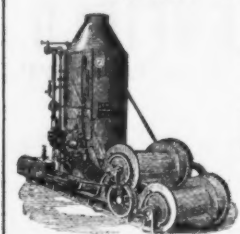
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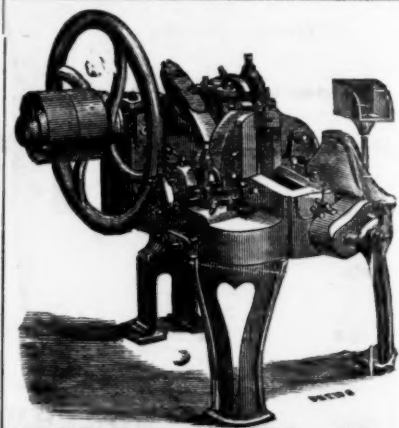
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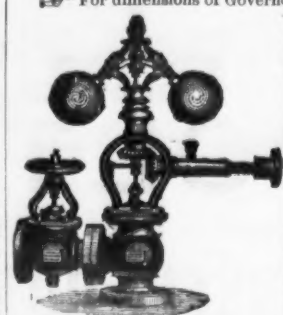
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3/8	18.00	20.00	1.00
1/2	20.00	22.00	1.00
5/8	23.00	26.00	2.00
3/4	26.00	30.00	2.50
7/8	31.00	35.00	3.00
1	36.00	41.00	3.50
1 1/4	40.00	45.00	3.50
1 1/2	45.00	51.00	3.75
1 3/4	50.00	57.00	4.00
2	59.00	67.00	4.50
2 1/4	69.00	78.00	5.00
2 1/2	80.00	90.00	5.50
3	90.00	101.00	6.00
3 1/2	105.00	117.00	6.50
4	120.00	133.00	7.00
4 1/2	140.00	156.00	8.00
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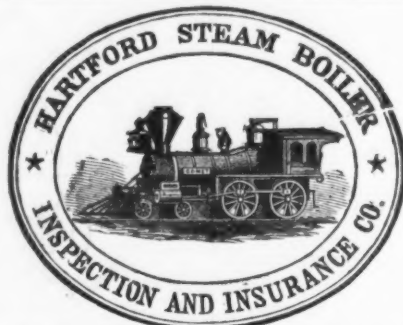
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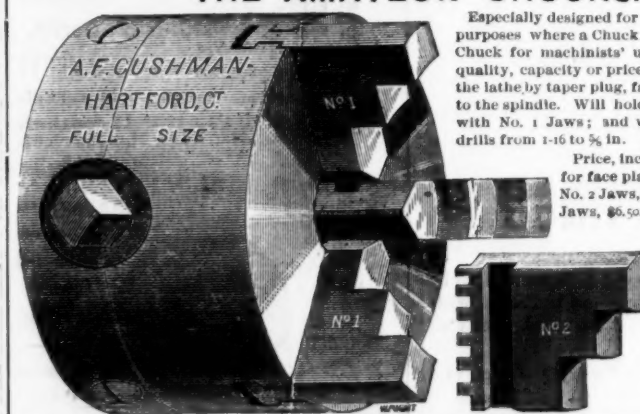
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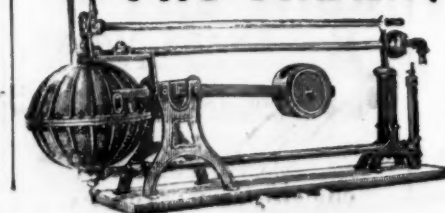
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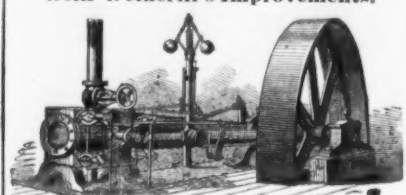
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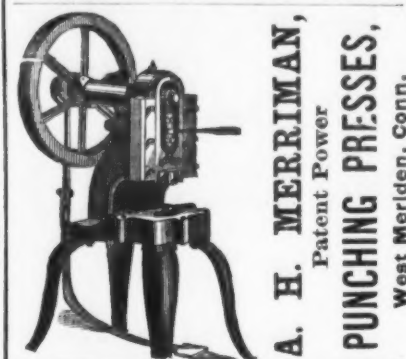
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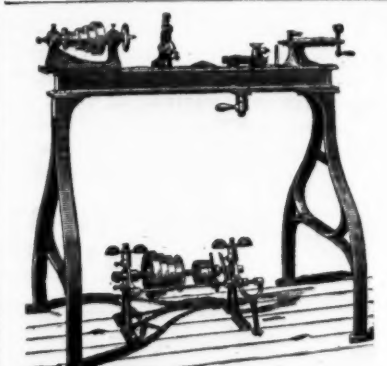
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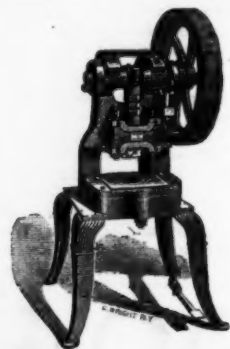
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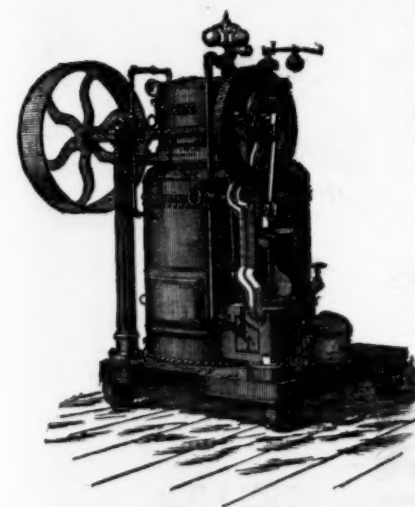
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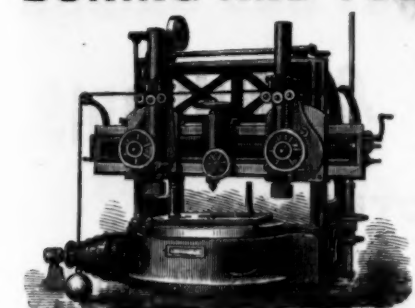
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See cut of Elevator Hoisting Machine in issue of July 18, 1876, page 40.

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"BOYNTON'S SAWS were effectually tested before the judges at the Philadelphia Fair, July 6th and 7th. An ash log, eleven inches in diameter, was sawed off, with a four-and-a-half-foot lightning cross-cut, by two men, in precisely six seconds as timed by the chairman of the Centennial Judges of Class Fifteen. The speed is unprecedented, and would cut a cord of wood in four minutes. The representatives of Russia, Austria, France, Italy, Spain, Belgium, Sweden, England, and several other countries, were present, and expressed their high appreciation."

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THE MOHAWK & HUDSON MANUFACTURING CO., Waterford, N. Y. Fabricants et Brevétaires des Soupapes "Eddy", Robinets pour incendie, etc.

Souricières.
THE RIPLEY MANUFACTURING Co., Unionville, Conn. Fabrication de la source "The Day Deceiver", le "Joyeux Trompeur", la meilleure source pour attrapper les souris vivantes.

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LYON, N. Albany, N. Y. Fabricant de supports de talons de chaussure, métalliques brevetés. Demandez le prix-courant illustré.

Terrains minéraux.
HOSKINS, W. A., Chattanooga, Tenn. Agent pour la vente de terres minérales d'une grande valeur.

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THE MORSE TWIST DRILL & MACHINE CO., New Bedford, Mass. Seule fabrication de la tarier à spirale à vis double renforcée brevetée de "Morse"; du mandrin centralisateur automatique breveté de "Beach", etc., etc.

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TUCKER & DORSEY, Indianapolis, Ind. Tiroirs susceptibles de 32 changements.

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BLAISDELL P. & CIE., Worcester, Mass. Fabricants de machines outils, drilles à trépan, tours, etc.

JOHNSON, ISRAEL H. & CIE., 440 S. Twelfth St., Philadelphie. Fabricants d'outils et d'outillage mécanique; occupent notamment par l'économie du combustible.

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Trappes à vapeur.
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SHOOTS, VINTON & CIE., Horseheads, N. Y. Fabricants des tuyaux d'eau en bois brevetés de Shoos.

Tuyaux de plomb.
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Tuyaux de Poêle et Coudes.
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SHEPARD, SIDNEY & CO., Buffalo, N. Y. Scies circulaires à dents mobiles et à deux mains perforées ainsi que toute espèce de scies solides.

THE STAMPED STOVE PIPE ELBOW CO., 1400 W. 14th St., Cleveland, Ohio, fabrication de coudes de tuyau brevetés de Hogen.

Tuyaux radiateurs.
EATON, COLE, BURNHAM & CIE., 58 John St., New-York. Fabricants du RADIATEUR EN FER FONDU, breveté de Shaw, le seul sur le marché dans lequel la chaleur circule.

DUNN FAON PARFAITS, Thomas Hart, 715 Fulton St., Phila., agent.

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THE PASSAIC ZINC CO., fabrication de Zinc pur. Manning & Squier, agents généraux, 113 Liberty Street, New-York.

The Iron Age
Revue de la Quincaillerie, de la Ferronnerie et du Commerce des Métaux en Amérique.
Publié tous les Jours par DAVID WILLIAMS, au No. 83 Reade St., New York.

En vue du développement rapide aux Etats-Unis du commerce d'exportation de Machines, Outils, Quincaillerie, Utensiles de ménage et autres objets métalliques, nous appelons l'attention des gens du métier à l'étranger sur notre publication "THE IRON AGE", dans la certitude que tous ceux qui s'intéressent aux produits de l'industrie américaine, à ses machines et à ses procédés de fabrication, la trouveront d'une valeur immédiate et pratique.

Chaque exemplaire, en outre de ses autres points importants, contient plus de 500 annonces des principaux fabricants des Etats-Unis.

C'est pourquoi, nulles personnes engagées dans une branche quelconque du commerce des métaux, dans quelque partie du monde que ce soit, ne peut manquer de trouver des annonces d'articles nouveaux qu'elle peut introduire avec succès dans son commerce, et l'adresse des fabricants de presque tous les articles de Ferronnerie américaine.

La réputation de supériorité des Américains pour la Quincaillerie, les Machines et les Outils est universelle, et la condition des affaires dans ce pays-ci pendant ces dernières années a forcé les fabricants à chercher l'étranger un débouché pour leurs produits, tout en les mettant à même de baisser leurs prix de manière à permettre l'importation de leurs produits dans beaucoup de localités et de faire concurrence aux articles de fabrication étrangère.

On en expédie maintenant de grandes quantités dans presque toutes les pays civilisés du monde et surtout en Angleterre et dans ses colonies, en Russie, dans l'Amérique Centrale et dans celle du Sud, aux Antilles et sur presque tous les marchés, qui jusqu'à présent ont été le monopole des produits des fabricants de la Grande-Bretagne et du Continent.

Aussi les fabricants américains font-ils maintenant de plus grands efforts que jamais pour introduire leurs produits fabriqués à l'étranger et on les trouve prêts à offrir des conditions avantageuses aux maisons étrangères responsables, qui désiraient placer leurs marchandises.

"THE IRON AGE" est le seul représentant accrédité du Commerce de la Quincaillerie, de la Ferronnerie et des Métaux en Amérique, et il compte parmi ses abonnés presque la totalité des personnes qui y sont engagées. Quant à la circulation à l'étranger, il a des abonnés réguliers au Canada, en Angleterre, en Irlande, en Ecosse, dans la principauté de Galles, en France, en Allemagne, en Belgique, en Suisse, en Autriche, en Suède, en Norvège, en Russie, aux Antilles, aux Indes Orientales, au Brésil, au Mexique, au Chili, à Buenos-Ayres, aux îles Sandwich, en Australie, dans la Nouvelle Zélande et dans la Nouvelle Galles du Sud.

Croyant que pour accroître de beaucoup notre circulation, il suffira de placer "THE IRON AGE" entre les mains de ceux qui les marchands de journaux et les libraires ont le moyen de la porter de tous ceux qui représentent le Commerce de Quincaillerie, de Ferronnerie et des Métaux dans tous les pays du monde.

Toutes les annonces régulières paraissent dans chacune des trois éditions, les personnes qui ne désirent le journal que pour savoir le nom et l'adresse des fabricants, trouvent leur affaire dans l'édition mensuelle et à très peu de frais.

Des spécimens de notre journal seront envoyés, franco, et avec plaisir dans toutes les parties du monde.

TAUX D'ABONNEMENT (PORT COMPRIS).

	Hebdomadaire.	Semi-mensuel.	Mensuel.
Etats-Unis, Canada et îles Sandwich	\$4.50	\$2.50	\$1.15
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Les annonces de longue durée faites par traite payable à l'ordre de DAVID WILLIAMS, sur une banque quelconque en Amérique ou en Europe, ou bien si l'on ne peut se procurer de traite, on peut envoyer le montant en timbres-poste, de quelque pays que ce soit. Un dollar est égal à 4 shillings Sterling ou à 5 francs.

Les marchands de journaux et les libraires peuvent se procurer THE IRON AGE par l'entremise de l'American News Company, New York, U. S. A.; de la Willmer & Rogers News Company, New York, U. S. A.; et de Londres, England; ou de la San Francisco News Company, California, U. S. A.

S'adresser à DAVID WILLIAMS, 83 Reade St., New York, U. S. A.

The Iron Age
Revue de la Quincaillerie, de la Ferronnerie et du Commerce des Métaux en Amérique.
Publié tous les Jours par DAVID WILLIAMS, au No. 83 Reade St., New York, U. S. A.

Da sich ein großer Aufschwung im Exporte amerikanischer Maschinen, Werkzeuge, Eisenwaren und anderer Eisenfabrikate bemerkbar gemacht hat, erlauben wir uns die Quincailleriebranche fremder Länder auf unsere Zeitschrift die "Iron Age" aufmerksam zu machen; sie ist von großem praktischen Werte für alle, die ein Interesse an amerikanischer Eisenfabrikation und Maschinen, und an der Art und Weise ihrer Konstruktion nehmen. Jedes Exemplar enthält neben anderem vornehmlich Verrückte, die Amerikanen von ungefähr 500 der größten aus Metall hergestellten Gegenstände und Fabrikanten der Vereinigten Staaten. Ein jeder, der in irgend welcher Branche des Eisenhandels betheiligt ist, kann nicht umhin vernehmen, in welcher Weise unsere Zeitschrift über neue erfindene Gegenstände, welche zur Verbesserung in seiner speziellen Branche einführen könnte, als auch die handhabungsfähigen Fabrikanten amerikanischer Eisen- und Stahlwaren vorführt.

Der Name, den sich die amerikanischen Eisenwaren, Maschinen und Werkzeuge wegen ihrer vorzüglichen Qualität erworben haben, ist weltweit bekannt. Die Gegenstände, welche während der letzten Jahre in diesem Lande hergekommen, haben amerikanische Gegenstände, einen fremden Markt für ihre Produkte zu finden, und gleichzeitig den amerikanischen Gegenständen Konkurrenz zu leisten. Große Quantitäten werden jetzt nach allen civilisierten Ländern der Welt verschifft, so nach England und seinen Colonien, Australien, Central- und Süd-Amerika, West-Indien und allen anderen Märkten, welche früher englische und continentale Eisenfabrikate bezogen.

Amerikanische Fabrikanten machen jetzt die größten Anstrengungen, ihren Waren einen Markt in fremden Ländern zu eröffnen, und sind für willkommene Quantitäten amerikanischer Eisen- und Stahlwaren bereit, die gegenwärtig in die liberalen Märkte zu fließen.

Die "Iron Age" ist die einzige anerkannte Zeitschrift, die die Interessen der amerikanischen Eisenwaren-, Maschinen- und Stahl-Industrie repräsentiert, und welche die Aufmerksamkeit der angestrebten Handelskreise in diesem Lande und in allen anderen Ländern auf sich zieht. Sie enthält eine vollständige, regelmäßig aktualisierte Liste der in England, Irland, Schottland, Wales, Frankreich, Deutschland, Belgien, der Schweiz, Dänemark, Schweden, Norwegen, Russland, Dänemark, Brasilien, Argentinien, Chile, Peru, Australien, den Sandwich-Inseln, Australien, New Zealand und New South Wales auf.

Wir glauben, daß wir die Circulation unserer Zeitschrift im Ausland beträchtlich vermehren können, indem wir jedem, für den sie von Werth sein könnte, ein Exemplar gratis senden, und haben wir bereits die umfangreichen Verzeichnisse der Namen der Fabrikanten, die in England, Frankreich, Deutschland, Belgien, der Schweiz, Dänemark, Schweden, Norwegen, Russland, Dänemark, Brasilien, Argentinien, Chile, Peru, Australien, den Sandwich-Inseln, Australien, New Zealand und New South Wales auf.

Unsere Zeitschrift der Probe-Exemplare enthält bereits mehrere Tausende von Namen von Eisenfabrikanten aller Länder, die wir schreiben und, die sich nach Kräften zu vergrößern. Zeitschrift wird sich sehr schnell verbreiten, und wir werden sehr dankbar sein, die Namen ausländischer Fabrikanten und Eisenfabrikanten zu erlangen; auch wird Information betreffs ausländischer Eisenfabrikanten erlangen. Für jede diebische Auskunft, die zu einer Vergrößerung der Circulation unserer Zeitschrift führt, wird eine liberale Vergütung gegeben.

Da alle regelmäßigen Abonnenten in 3 Ausgaben unserer Zeitschrift erscheinen, so würde die monatliche Ausgabe allen denen zufließen, die die Zeitschrift nur wegen der streifen amerikanischen Eisenfabrikate zu halten gedenken, diese würde nur mit einem geringen Aufwande verbunden sein.

Probe-Exemplare werden allen freundlichst ohne Kosten gesandt.

Das Abonnement mit Porto beträgt:

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Zeitschrift und Abonnenten in irgend welchem Welttheile, können die "Iron Age" durch die American News Company, New York, U. S. A.; die Willmer & Rogers News Company, New York, U. S. A.; in London, England; oder die San Francisco News Company, California, U. S. A. beziehen.

Gefälligst zu schreiben:
Mr. DAVID WILLIAMS,
83 Reade Street, New York, U. S. A.

The Iron Age

A Review of the American Hardware, Iron and Metal Trades.

Published every Thursday, by DAVID WILLIAMS, at No. 83 Reade St., cor. Church, New York.

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BRITISH AGENCY. The publishers of The Ironmonger, 44a Cannon Street, London, England, will receive orders for subscriptions and advertisements on their regular terms.

AUSTRALIAN AGENCY. The American Hardware Company, Melbourne are our agents for Australia. Sample copies will be mailed by them, free of charge, to any firm engaged in the trades we represent in Australia, Tasmania and New Zealand.

The circulation of The Iron Age is more than double that of any other journal of its class in the world. Established in 1855 under the name of The Hardware Man's Newspaper, changed in 1859 to The Iron Age, it is the oldest publication of its class in the world. The next in age is the Ironmonger of London, established in 1859. Until 1870 The Iron Age was the only publication of its class in the United States.

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The Iron Age

Revista de ferreteria americana y de las industrias ferreas y de metales.

Se publica todos los Jueves por DAVID WILLIAMS en Reade Street, No. 83, Nueva York.

En vista del rápido desarrollo del comercio de exportación de los Estados Unidos en Maquinaria, Instrumentos, Ferrería, etc., para las industrias de los países extranjeros, llamamos la atención del comercio en los países extranjeros hacia el periódico THE IRON AGE, creyendo que todos los que se interesan en los productos, maquinaria o métodos de manufactura americana, lo hallarán de un valor práctico e inmediato. Cada número de este periódico contiene una lista de los principales fabricantes de los principales fabricantes y comerciantes de los Estados Unidos; y ninguna persona que se ocupe de algún ramo de las industrias de metales, en cualquiera parte del mundo, dejará de hallar en sus números artículos que pueden introducirle con éxito en su comercio, así como el nombre y dirección de los fabricantes de casi todos los artículos de Ferrería Americana.

La reputación de la calidad superior de la Ferrería Americana, Maquinaria e Instrumentos, es universal; y el estado del tráfico en este país en los últimos años ha obligado a los fabricantes a buscar una salida en el extranjero para sus efectos, al mismo tiempo que les ha facilitado abaratar sus productos hasta un punto que permite su exportación a muchos mercados a precios que compiten con los artículos de manufactura extranjera. En la actualidad se envían grandes cantidades a casi todos los países civilizados del mundo, y especialmente a Inglaterra y sus colonias, Rusia, América Central y Meridional, las Antillas, y a casi todos los mercados que hasta ahora consumían los productos manufacturados por la Gran Bretaña y el Continente.

Los fabricantes americanos, por lo tanto, hacen en la actualidad mas grandes esfuerzos que nunca para introducir sus productos en los países extranjeros, y se hallan dispuestos a ofrecer alientes a las casas extranjeras de responsabilidad que deseen ocuparse de sus mercancías.

El periódico THE IRON AGE es el órgano reconocido de la Ferrería e industrias ferreas y de metales de América, y casi todos los que pertenecen a esos ramos de comercio, están suscritos a él. Su circulación en el extranjero incluye suscripciones en Canada, Inglaterra, Irlanda, Ecosia, Gales, Francia, Alemania, Bélgica, Suiza, Austria, Suecia, Noruega, Rusia, las Antillas, Brasil, México, Chile, Buenos Ayres, las islas Sandwich, Australia, Nueva Zélandia, y Nueva Gales del Sur.

Creyendo que un aumento en nuestra circulación en el exterior podía obtenerse poniendo simplemente ejemplares de THE IRON AGE en manos de los que lo necesitan, hemos tomado las medidas convenientes para hacer que llegue al conocimiento personal de todos los que representan la Ferrería e Industrias ferreas y de metales en todos los países del mundo. Enviamos de ejemplares de muestra para enviar por el correo, comprendiendo varios miles de nombres en todas partes del globo, y aun tomamos medidas para acrecentarla. Por lo tanto quedaremos muy agradecidos a todo el que en este o en otro país nos suministre nombres de fabricantes extranjeros que comercian con mercancías de metal. También desearíamos particulares concernientes a los directorios extranjeros. Cualquier informe que pueda tender a la extensión o mejora de nuestras listas, será pagado liberalmente.

Como todos los anuncios regulares aparecen en las tres ediciones, las personas que solo deseen el periódico como medio de conocer los nombres y dirección de fabricantes americanos, verán que la edición mensual les sea objeto con muy poco costo.

Ejemplares de muestra se enviarán gratis por el correo a cualquier parte del mundo.

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